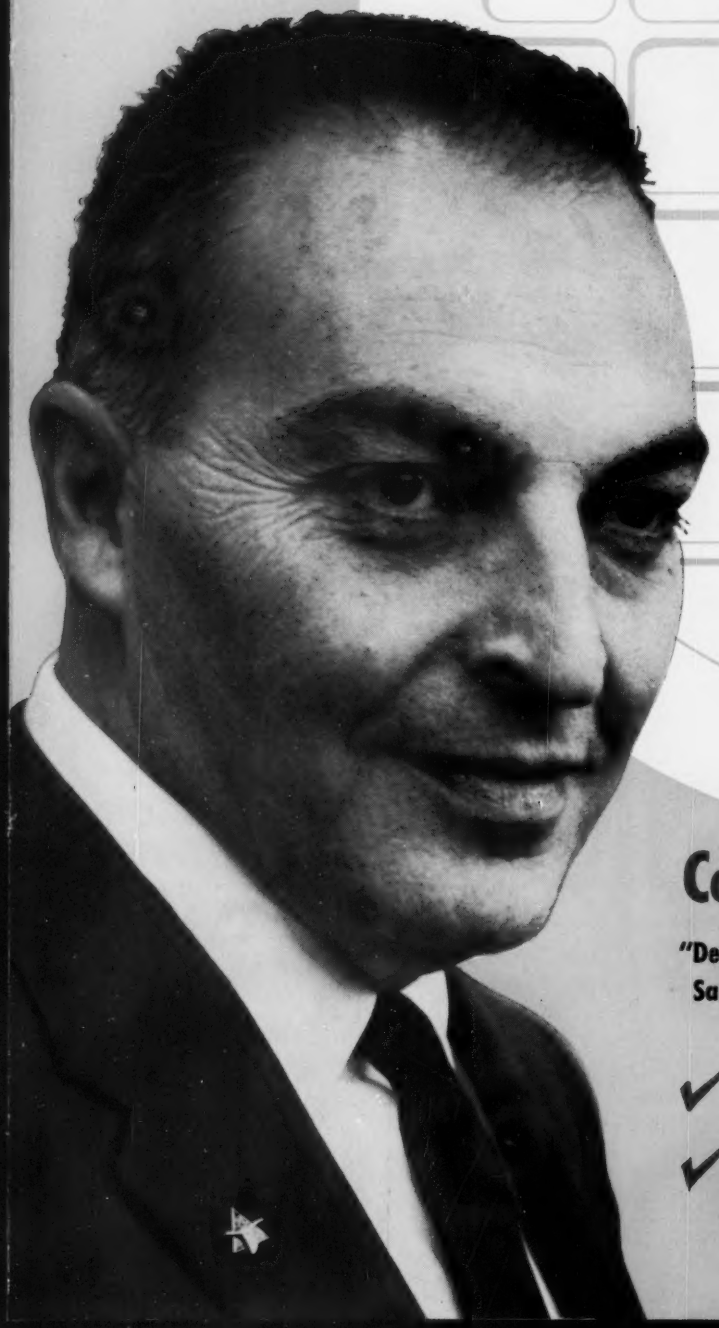
production ideas
NO. 11 OF A SERIES

JUNE 3, 1957

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



Contouring with Chemicals

"Designer has greater freedom," says Manuel C. Sanz, the inventor . . . page 85

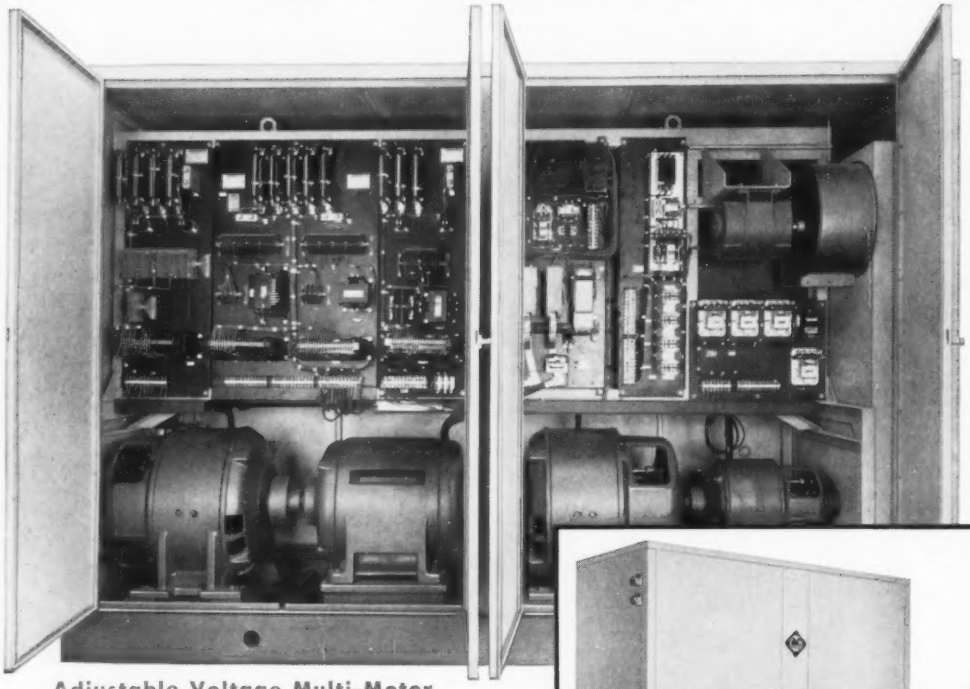
✔ PA's See Autumn Inventory Rise . . . page 51

✔ Steel Industry Capacities . . . page 115

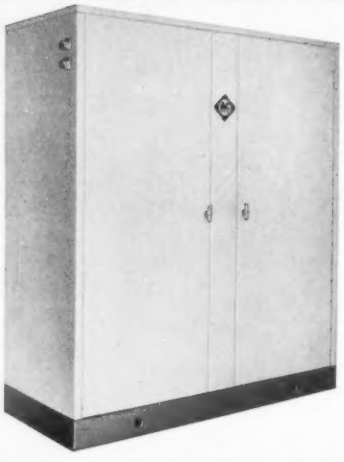
CONTENTS — PAGE 5

There's MORE dependable speed control

- high response
- high shock resistance
- no fragile parts
- no maintenance



Adjustable Voltage Multi-Motor Package Drive used with heat flattening and coating equipment. Unit features magnetic amplifier control of tension and strip speed.



Size 3 Adjustable Voltage Power Unit rated 30 hp, of standard construction. Magnetic amplifier excitation provided.

Every one of the design features of the Allis-Chalmers Adjustable Voltage Package Drive assures you an easy, dependable means of power conversion.

Key to Package Drive dependability is the use of a magnetic amplifier to excite the field of the power unit m-g set. Sturdy and simple, this amplifier has no moving parts to wear out . . . no fragile components to be affected by vibrations. AND — there's no wasteful "warm-up" time needed. At the turn of a dial, you get immediate speed control.

Cost-saving assembly

M-g set and control components are assembled in the power unit enclosure at the factory — saving you installation costs. Enclosures used for 30 through 200-hp units are completely collapsible and may be easily disassembled without loss of rigidity. Larger units have separately driven blowers to provide positive ventilation and pressure even when unit is idle.

Available in units from 5 to 200 hp, the package drive is ideal for any application requiring adjustable speed. Contact your nearby Allis-Chalmers sales office or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-5299

XXI

This is the twenty-first of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

How Alloy Steels Respond to Induction Hardening

In the now-popular induction-hardening process, steel is first heated above the transformation range by means of electrical induction, then quenched as required. Special equipment is needed, and heat is developed as follows:

High-frequency alternating current passes through a coil or inductor, with the result that a magnetic field is created in the coil. When the piece to be treated is placed in this field, it is heated rapidly by induced energy. With the various types of induction-heating equipment, the process is capable of surface- or case-hardening to various controlled depths; however, through-hardening can be obtained with certain alloy steels. Ferrous metals that respond well to induction hardening include numerous grades of both alloy and carbon steels, as well as hardenable stainless steel and plain or alloyed cast iron.

As a rule, when alloy steels containing no carbide-forming elements are heated by induction, the usual hardening temperatures can be used. But with alloy steels that do contain such carbide-forming elements as chromium, molybdenum, and vanadium, the hardening temperature must be increased if shallow cases are required and the normal effect of the alloying elements is desired.

Hardness obtained by the induction process is a function of the carbon content and prior structure, just as it is when conventional heating methods are used. Nevertheless, higher surface-hardness values for a given carbon content have often been noted in parts subjected to surface induction-hardening. The extra hardness may be as much as five Rockwell C points for steels of 0.30 pct carbon.

As pointed out previously, the induction method requires special equipment. However, it possesses several marked advantages, including speed of heating and cleanliness of operation. Pieces heated by induction are usually subject to a minimum of scaling and distortion. Moreover, induction-hardening equipment is very compact and therefore conserves floor space.

If you would care to know more about the induction hardening of alloy steels, you are invited to communicate with our technical staff. Bethlehem metallurgists have made a thorough study of the subject, including the many details of quenching and tempering. Call them if they can help you in any way. And remember, too, when considering sources of alloy steels, that Bethlehem makes the full range of AISI standard grades, as well as special-analysis steels and all carbon grades.

If you would like reprints of this series of advertisements from No. I through No. XX, please write to us, addressing your request to Publications Department, Bethlehem Steel Company, Bethlehem, Pa. The first 20 subjects in the series are now available in a handy 36-page booklet, and we shall be glad to send you a free copy.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

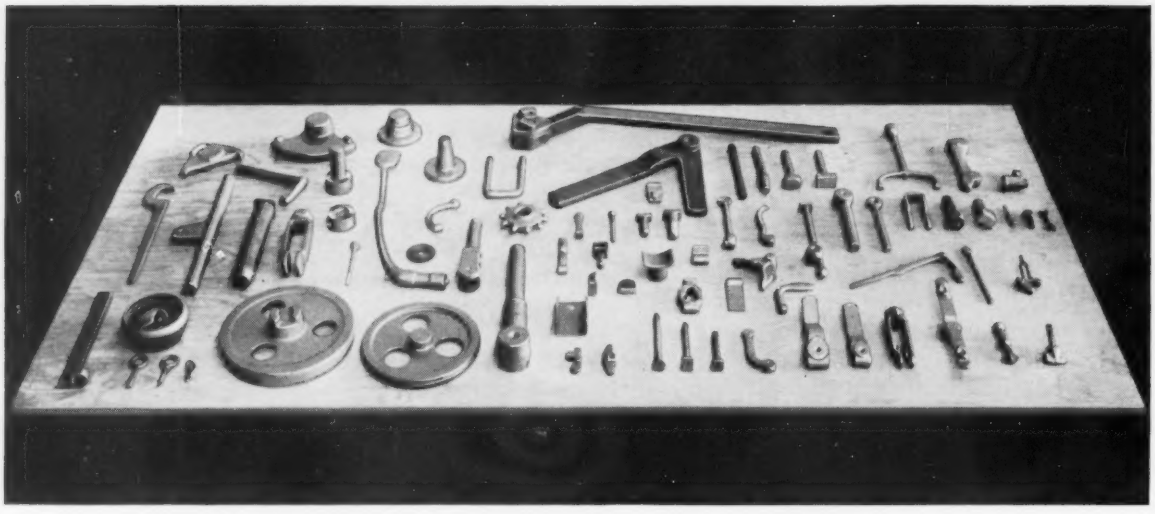
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

200 Different Parts Heated for Forging-

Better, Faster and at Much Lower Cost

with TOCCO* *Induction Heating*



• When progressive production people at General Railway Signal Company installed a 200 kw, 3000 cycle TOCCO machine, they were able to eliminate 7 slot-type oil-fired furnaces and produce better forgings than ever before—at substantially lower costs.

Cost Down—Fuel costs have been reduced from $15.26 to $1.60 per hour with TOCCO. Expensive furnace lining maintenance has been eliminated, and straightening and reheating operations formerly required are no longer necessary.

With oil-fired furnaces all steam hammer operators needed helpers. With TOCCO most of these helper operations have been eliminated.

TOCCO's fast, automatic operation produces almost no scale and achieves uniform temperatures throughout the entire cross section—improving the quality of the forgings and providing increases of up to 40% in the life of the forging dies.

Overall production costs in the forge shop at G.R.S. have been reduced an impressive 35%!

Flexibility—Production runs at G.R.S. range from a low of 15 pieces to a high of over 50,000. Parts from ½ pound to over 25 pounds are heated, merely by changing inductor coils and power control settings.

Better Working Conditions—TOCCO makes the forge shop a better place to work by doing away with noise, dust, dirt, smoke and radiant heat and gases produced by old fashioned furnaces.

If you're looking for a way to produce similar results in your plant, it will pay you to consult a TOCCO Engineer.

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today—**NEW FREE Bulletin**

The Ohio Crankshaft Co. • Dept: S-6, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Heating for Forming and Forging".

Name_____

Position_____

Company_____

Address_____

City_____ **Zone**____ **State**_____

®Traveloader ...unloads 8 cars per day ...former method 1 car per day!

Auto frames arrive at this assembly plant on flat cars—120 frames per car (6 stacks of 20 frames). Traveloader, the unique Baker side-loading fork truck, handling 20 frames at a time, unloads, transports and stacks them in the storage area at the rate of one car every 30 minutes. Thus 6 carloads—sometimes 8—are handled in less than a day with the Traveloader and one operator.

A former method, using a fork truck, required two men plus the truck and driver to do the job—and one carload per day was the limit of the crew. The capacity of the truck was 6 frames per load. Cars, waiting to be unloaded, piled up on the tracks and demurrage charges resulted.

Besides unloading the frames, the Traveloader has time for many other handling jobs. If you have a difficult handling problem involving big, awkward or long loads, let us help you solve it with Traveloader. Write for Bulletin 1360.

Baker®
industrial trucks

THE BAKER-RAULANG COMPANY
1259 WEST 80th STREET • CLEVELAND 2, OHIO
A Subsidiary of the Otis Elevator Company

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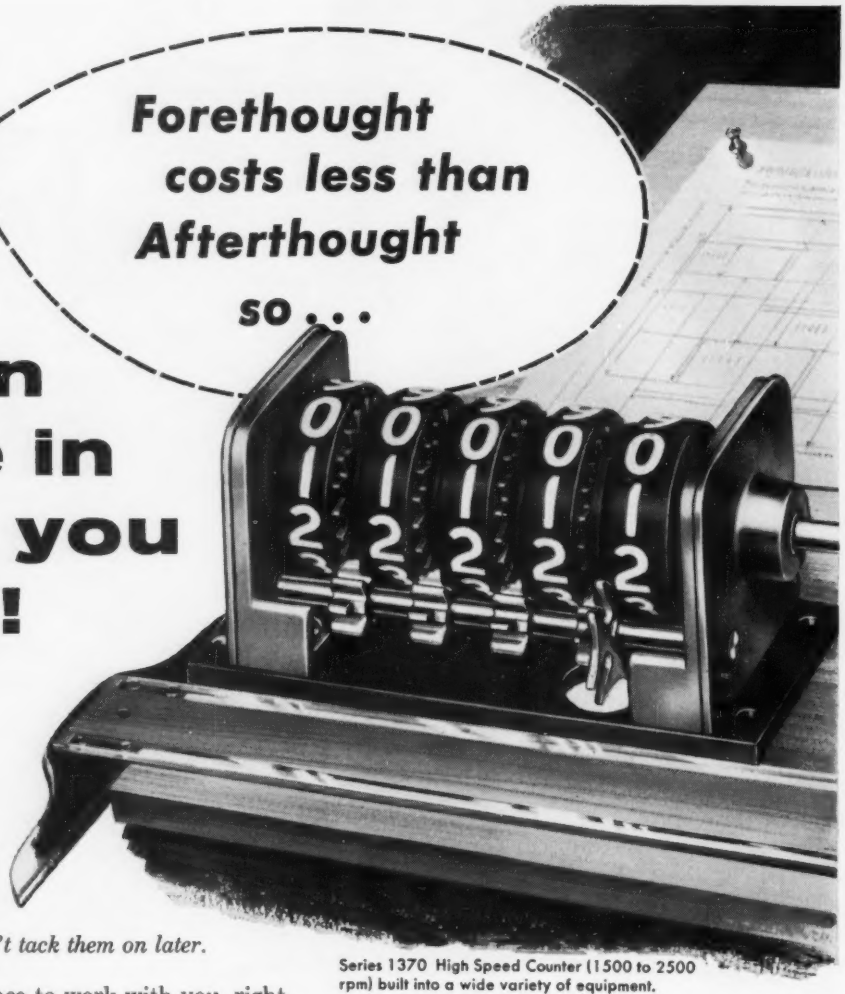
TT5

Forethought costs less than Afterthought so . . .

Design These in When you Begin!



Series 1370 High Speed Counter (1500 to 2500 rpm) built into a wide variety of equipment.

If you need mechanical or electrical counters in any of your new products, here's a word to the cost-wise designer: *Design them in, when you begin . . . don't tack them on later.*

For if you'll give us a chance to work with you, right from the beginning, chances are we can save you time and money by adapting or modifying a *standard* Veeder-Root Counter to your needs . . where you might get into a costly special job if you went about it alone. What's more, you save time in your engineering, purchasing and assembly departments.

Count on Veeder-Root to help you in every way . . . from design to delivery. Write:

Everyone... Can Count on Veeder-Root

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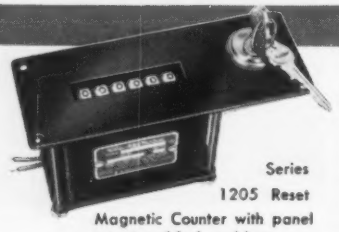
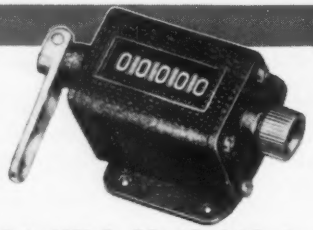


Series 1205 Reset Magnetic Counter with panel mount and lock and key.



Series 1122 Small Reset Ratchet Counter.

Special Longitude Counter, one of many made for aircraft navigational equipment.

IN THIS ISSUE

STEEL
The Metalworking Weekly

June 3, 1957
Vol. 140 No. 22

METALWORKING OUTLOOK
45 **Sentiment for right-to-work laws gains** in wake of the Beck affair. Legislation already is in effect in 18 states.

51 **Inventories to stay level until autumn,** then rise, PAs predict

52 **Expansion in ferroalloys**—Enlarged plant to produce 200,000 tons a year

53 **Best year for electronics**—Factory sales alone will run about $6 billion

54 **Power tool sales still climbing,** and there's no peak in sight

55 **Nuclear powered aircraft now certain,** says head of Lockheed project

56 **Worst housing shortage ever seen by '60s** unless building regenerated now

57 **Ultrasonic cleaning market**—A potential $2 billion in equipment sales

61 **Renault likes automation**—Output up, labor and production costs down

62 **Paper work chokes profits**—Industry warned red tape leads to red ink

63 **Showroom selling pays,** machine tool distributor finds

79 **"Industrial spider" installed by AS&W** to make welded wire fabric

TECHNICAL OUTLOOK
83 **Modification of 4340 steel shows promise** of providing sufficient ductility for aircraft landing gear, other uses

84 **New flux-CO_2 shield improves welds**—It's a semiautomatic process

COVER ARTICLE
85 **Contouring with chemicals**—Milling process grows at phenomenal rate

89 **Airless abrasive blasting** eliminates a lot of acid pickling

90 **New portable inspection tool** can be used to check specs in field

92 **Progress in Steelmaking**—Oxygen conversion in the open hearth

98 **Improved metals for castings**—Foundrymen told about latest advances

104 **Dow unveils giant extrusion press**—It'll make bigger, better shapes

105 **Treated black plate** replaces tin plate for some containers

SPECIAL SECTION
115 **Steel industry capacities**—First report in three years

MARKET OUTLOOK
133 **June steel specifications up slightly**—Indexes and composites, 143; steel prices, 144; ores, 150; ferroalloys, 151; scrap trends, 155, prices, 156

135 **Imports fill iron ore gap**—As direct shipping grades in Lake Superior area peter out, development of foreign fields and agglomerates accelerates

158 **Nonferrous metals**—Competitive summer ahead—Prices, 160

REGULAR FEATURES

6 Behind the Scenes
10 Letters to the Editors
16 Staff
23 Calendar of Meetings
49 The Editor's Views
58 Windows of Washington
65 Mirrors of Motordom
69 The Business Trend
73 Men of Industry
76 Obituaries
97 Machine Topics
107 New Products
113 New Literature
163 Advertising Index

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Index available semiannually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

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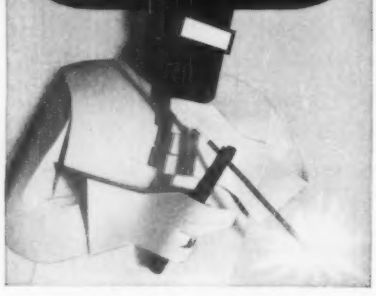
should have the
opportunity
of trying this new
HOBART
413
ELECTRODE!



SPEEDS
WORK — LOWERS COST

An actual trial on your own work is the best way of making a comparison. Here's an electrode, field tested, with the widest range of applications, high speed, with X-ray quality. No special training required —no special techniques. An easy to use electrode on mild steel from heavy to light gauge. Don't miss the advantages of this new electrode. Ask for samples.

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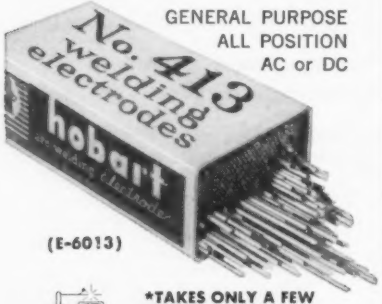
AC or DC



(E-6013)

*TAKES ONLY A FEW MINUTES TO TRY ON YOUR OWN WORK

Hobart

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☐ Send information on HOBART 413.
☐ I would like to try some samples.
☐ Send complete catalog on electrodes.
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Name _____
Street _____
City _____ County _____ State _____

behind the scenes

Inventor Itches To Etch

To the average person, 2,739,047 suggests nothing more than a clump of numbers; it could represent a license plate, a pile of money or the mileage between Gnaw Bone, Ind., and Palembang, Sumatra—on about 220 round trips, that is. To Manuel C. Sanz, materials research and process group leader, Aerophysics Department, North American Aviation Inc., Downey, Calif., 2,739,047 is a U.S. patent number. It was granted to Mr. Sanz by our sovereign republic in recognition of his process for making of metal parts by dissolving excess material in an appropriate reagent, while desired metal surfaces are protected by an effective mask.

You met Mr. Sanz a few moments ago; that was him on the front cover —and please let us not get into that "he" and "him" business. If we surrender on this point, they'll try to pressure us into saying "eyether" for either, and there's no telling how far a body can slip once his resolution is broken.

We asked Technical Editor Allen Gray, who spent a day recently with Mr. Sanz, how an inventor goes about inventing things.

The Doctor Interprets

"It beats me," said Al. "Mr. Sanz told me he got to thinking how he could save weight in designing airborne vehicles and equipment. All kinds of problems there, you know. Make stuff light, and it loses strength. Make it strong, and it gets too heavy. Sanz got the idea of masking the areas in which the original thickness was to be retained, then etching away the metal from the unmasked areas to the desired depth or thickness."

"Why, that's like photoengraving, isn't it?"

"Yes, in a way. Metal removal by either chemical or electrochemical action is not new. However, the idea of applying such a process in an exacting degree and under precise control to large areas to produce highly complex shapes, asymmetrical patterns, integrally stiffened structures and tapered skins is distinctly an innovation." (When Dr. Gray gets off the ground, he does you the honor of assuming that you understand everything he is saying.)

We got lost back by the second turn after chemical action, but that's because we're not qualified to fully appreciate the potentials of Mr. Sanz's invention. We're going to read all about it again, and we advise you to do the same. The story appears on page 85.

Conversation Pieces

This is as good a time as any to catch up on our puzzles. The General Steel Castings gang, Granite City, Ill., will swing at anything, and as a result holds a healthy batting average. When they sent in the correct answer concerning the probabilities of throwing a seven with a pair of dice (11/36) they wrote on the post card: "Don't take this as a reflection of how we spend our lunch hours here at the General Steel Commonwealth plant."

W. D. Thomas, Naval architect, I.D. Associates Inc., Kingston, N.Y., thought that the least integer not namable in fewer than 19 syllables was 177,777. Well, golly Ned, Mr. Thomas, we were tipped off that it was 111,777.

Stanley Domin, Peirce Wire Recorder Corp., Chicago, didn't trust Banker Burjevski at all; maintained that he didn't pay any interest. Stanley, a mathematician weighing 250 lb, told us that the answer was just short of $2.72, so you can understand why we ain't going to argue with him.

This is not a puzzle; it is something you can play with. Maybe you can win some money with it at your favorite pub if you can locate a sucker. It seems to be a mathematical fact that any number containing two or more digits may be rearranged in any order to form a new number, and that the difference between the first number and the second is always divisible by nine. Don't it beat the cars, Fred?

Shrdlu

(Metalworking Outlook—Page 45)

How do you keep rocketing at 8000 mph?

Courtesy: Resistoflex Corp., Roseland, N. J.

For one thing, you feed your rocket fuel – savagely corrosive stuff, like white and red fuming nitric acid. You use a fuel line of Teflon hose, wrapped in stainless wire braid – with special stainless steel fittings to make it stay put.

The fittings are swaged on – and listen to a few of the 19 test beatings they get. In an impulse test, with fluid temperature at 400° F., an impact of 4500 psi is applied, and reduced to zero in one second. The cycle is repeated 35 times a minute – for 100,000 cycles.

Another test, at 450° F., submits the hose and fittings to vibration at 2000 cycles per minute through ¾" lateral movement. This grueling test is applied for 200 hours . . . is followed by a severe high-pressure test to assure a leak-proof seal. It's hard on the fittings . . . but a positive test of durability.

Frasse has provided trouble-free stainless steel for this vital fitting application since its inception – and often supplied it *in hours,* to meet production deadlines. So, if you want reliability in your product, and a reliable source of supply . . . rely on Frasse for *all* your stainless requirements. It's a habit you'll find profitable.

Call FRASSE for COMPLETE STAINLESS STEEL SERVICE

Bars • Forgings • Sheets • Strip • Plates • Wire • Tubing • Pipe • Fittings • Valves

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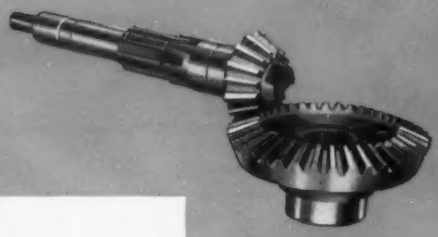
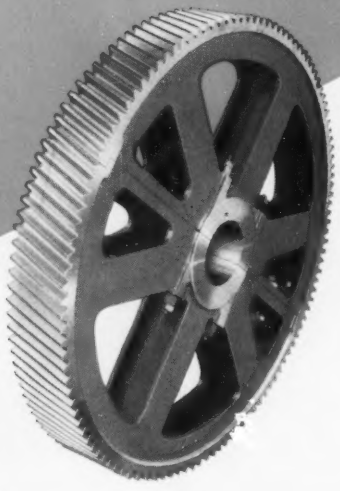


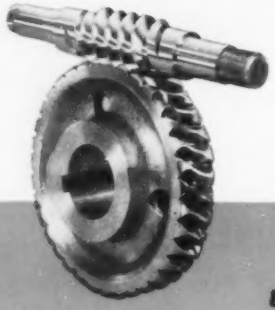
Quality with a pedigree

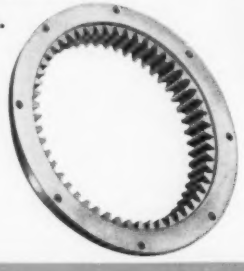
Every year more and more users of gears who demand the highest quality are turning to ILLINOIS GEAR to meet the exacting needs for this very important part of their equipment or machinery.

They have come to know and depend on ILLINOIS GEAR — a company with a rich heritage in the manufacture of quality gears . . . *from whose modern plants come the most complete line of gears in the world!*

If you use, specify or buy gears for any purpose — look to ILLINOIS GEAR as your most complete and dependable source.







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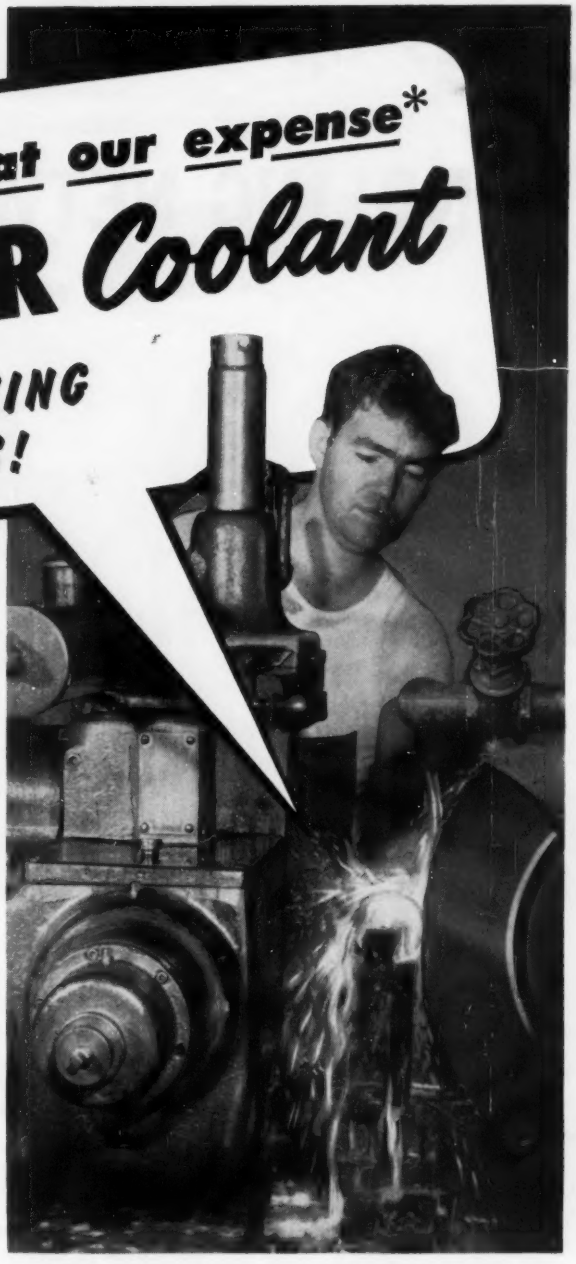
See For Yourself at our expense*

HAMIKLEER Coolant

(REG. U.S. PAT. OFF.)

CUTS METALWORKING COSTS 6 WAYS!



Here's how HAMIKLEER—the odorless, synthetic coolant and rust preventive—can cut your metalworking costs 6 ways:

1. By eliminating the need for and cost of many different coolants. HAMIKLEER can be used for practically any cutting, grinding or aqueous phase operation on cast iron, hard and soft steels.

2. By reducing rejects—speeding production. HAMIKLEER always keeps work cool, clean and visible, allowing finer surface finishes in shorter time.

3. By preventing rust—even in hot, humid weather—eliminating costly cleaning operations. HAMIKLEER is a rust preventive as well as a coolant and it will not turn rancid.

4. By increasing tool life to make fewer replacements. HAMIKLEER has excellent lubricity and anti-weld properties.

5. By lasting longer. The amount of HAMIKLEER consumed or "carried away" is held to an economical minimum by the thin body of the solution.

6. By eliminating costly disposal problems. HAMIKLEER can be run down drains without gumming or clogging, providing oils don't get into the mixture.

A large metalworking firm standardized on HAMIKLEER after testing 30 different brands of coolants. HAMIKLEER was the only coolant that proved overall superiority ... improving lubrication, cooling, rust prevention, better finish, longer tool life and wheel life.

SEND FOR FREE SAMPLE . . . *to test on your own metalworking operations.

HARRY MILLER CORP. HAMICO 4th & BRISTOL STREETS PHILADELPHIA 40, PA.

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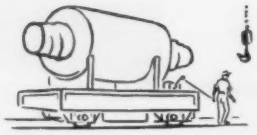
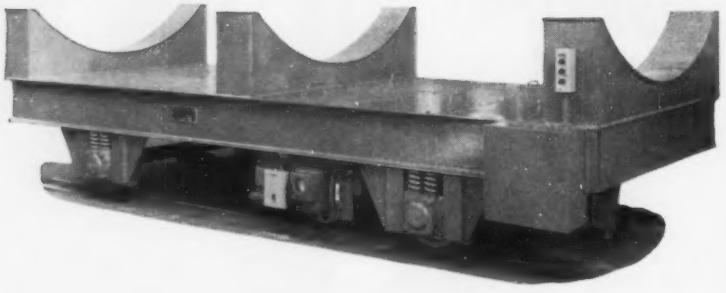
Links up your HANDLING NETWORK



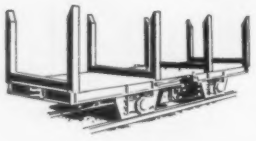
for added efficiency . . .

extra economy

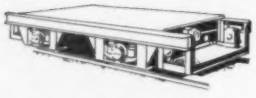


ATLAS WALK-ALONG

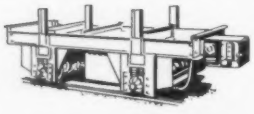
SAFETY-TYPE TRANSFERS



Special bed designs to cradle your load.



Single platform or double platform-operator rides.



Versatile power . . . diesel or gas electric, storage battery, or cable reel. Also remote control with no trailing cable.

If you're responsible for maintaining safe, low cost movement of heavy loads (5 to 200 tons) and intermediate transfer of these loads during process or storage, Atlas can help you by engineering a transfer car to meet your exact load and power requirements.

Atlas engineering gives you every modern safety feature for personnel protection.

. . . choice of power and control including:

1. Single lever (walk-along) forward, reverse with safety stop when lever is released.
2. Storage battery power with built-in charger.

For Cost-Saving Details Request "Walk Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

1140 IVANHOE ROAD • CLEVELAND 10, OHIO

ENGINEERS & MANUFACTURERS SINCE 1896

LETTERS
TO THE EDITORS

Helpful for Selling Ideas

Your Program for Management series continues to be one of the most interesting and valuable features of your magazine. I have found the articles most useful in selling ideas to higher levels of management, since they concisely, but interestingly, sum up the subject discussed.

The articles in the series are circulated as *special attention items* to all of our top management personnel.

Earl J. Handly
Engineering Manager
Receiving & Cathode Ray Tube Operations
Raytheon Mfg. Co.
Newton, Mass.

Inspector Enjoys STEEL

Please forward a copy of the article, "What Makes a Good Deep Drawing Steel?" (April 22, page 78). Your good magazine is always thoroughly enjoyed.

O. J. Daniel Jr.
Assistant Chief Inspector
De Soto Division
Chrysler Corp.
Detroit

Solving Inventory Problems

I found the article, "Inventory Management" (May 13, page 109), extremely informative and would like three additional copies for my personnel.

C. P. Osterman
Production & Material Control Manager
Baldwin Piano Co.
Cincinnati

I would appreciate a copy for future reference.

W. Ray Stevens
Purchasing Agent
Moto-Mower Division
Detroit Harvester Co.
Richmond, Ind.

Setting Up Brazing Standards

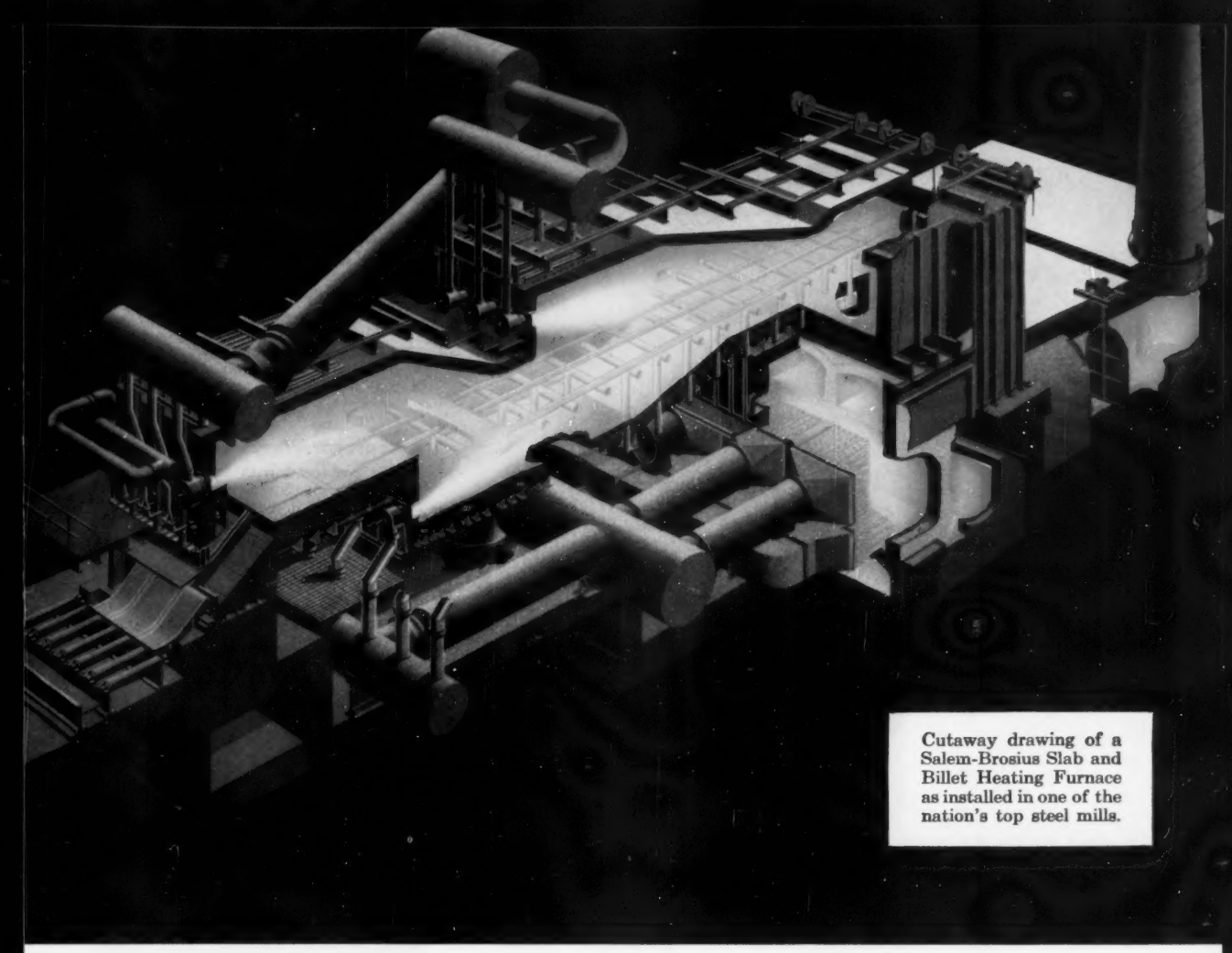
In the Apr. 29 issue, there is an informative article, "How To Braze Aluminum" (page 164). We are in the process of preparing a brazing standard for our factory and would like to have copies of all the articles in this brazing series.

J. K. Smith
Trainee Engineer
Cummins Engine Co. Inc.
Columbus, Ind.

Agrees with Appraisal View

We read with interest your article, "Appraisal: Valuable Tool" (Apr. 29, page 133), and agree with your opinions regarding the acceptance of the competent appraisal. However, we cannot understand how you can exclude us from your category of the "Big Three." We have a No. 1 rating under Dun &

(Please turn to page 12)



Cutaway drawing of a Salem-Brosius Slab and Billet Heating Furnace as installed in one of the nation's top steel mills.

In this Salem-Brosius furnace better steel products are born

All over the country, steel producers are turning to Salem-Brosius Pusher-Type Slab and Billet Heaters, because they have come to know that these furnaces will produce maximum tonnages of evenly heated, accurately temperatured steel at the lowest fuel consumption rate. The triple-fired furnace shown above features accurately controlled heating and soaking zones, heavy construction, recuperators for fuel economy, dual gas-oil fuel system, low maintenance cost, and many other advantages. These assure positive, automatic control of furnace output and heating quality.

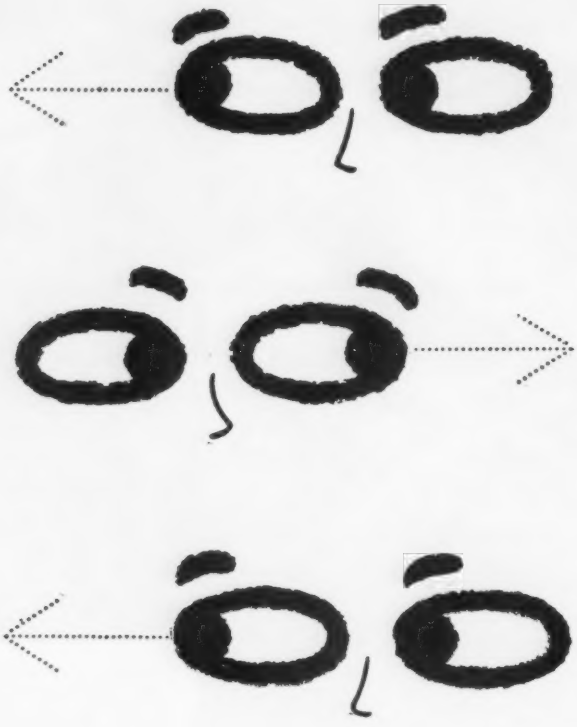
And the efficiency, economy, ease-of-operation, and trouble-free service this furnace affords are typical of all the furnaces Salem-Brosius builds. Whether you require this or any other heating or heat treating furnace, Salem-Brosius offers equipment designed, engineered, and built not merely as a furnace but as a heating machine. You can purchase these furnaces as complete installations—equipped with all controls, piping and wiring—ready to operate. Write to us.

SALEM-BROSIUS, INC.

CARNEGIE, PENNSYLVANIA

In Canada: Salem Engineering Limited • 1525 Bloor Street West, Toronto 9, Ontario

SPECIAL MECHANICAL EQUIPMENT • INDUSTRIAL HEATING FURNACES • MATERIALS HANDLING EQUIPMENT



Alternating stresses bear watching!

Back and forth . . . up and down . . . in and out . . . if those stresses keep changing, the life of a metal part is a hard one . . . and often a short one. Stress reversals can cause "fatigue" failure at stresses far below the expected strength of the metal.

One of the outstanding properties of phosphor bronze is its high resistance to fatigue failure. It is widely used for electrical switch parts, relay contact springs, bellows, rotating shafts and other moving or vibrating parts.

For detailed information on phosphor bronze, write to Riverside-Alloy Metal Division, H. K. Porter Company, Inc., Riverside, N. J.

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Prospect Park, Pa.

RIVERSIDE METAL
Riverside, N.J.

PRENTISS WIRE MILLS
Holyoke, Mass.

HKP RIVERSIDE-ALLOY METAL DIVISION
H. K. PORTER COMPANY, INC.

LETTERS

(Concluded from page 10)

Bradstreet and AAA rating in the *Thomas Register*.

We are also duly registered as a foreign corporation in many states.

H. J. Mollerus
Vice President
Industrial Appraisal Co.
Pittsburgh

• *We are glad to include Industrial Appraisal Co. among the leading appraisers.*

Researcher Wants Reprint

We have read with interest the article, "Brazing Stainless Steel Honeycombs" (Apr. 8, page 92), and would appreciate a copy for our files.

B. B. Sabouni
Director of Research
Soule Steel Co.
San Francisco

1953 Article Used in Talk

At a recent meeting of our company, an article from STEEL was referred to in a talk on the cold extrusion of steel.

If possible, we would like a copy of it, "Cold Extrusion of Steel" (July 27, 1953, p. 78).

D. Zingg
Metal Forming & Coining Corp.
Maumee, O.

Informative Presentation

We believe the article, "Profit Sharing" (Apr. 15, page 115), was well written and made an informative presentation of this rapidly growing program in industrial relations.

We would appreciate a reprint and would like permission to reprint. They would be sent to clients for whom we are administering profit sharing plans and other companies in New England.

David Heald
Sales Manager
Profit Sharing Systems Inc.
Manchester, N. H.

• *Permission granted.*

Selector to Czechoslovakia

Thank you for your booklet, "Metal Selector" (Oct. 1, 1956 insert), which arrived here safely. It has been of great interest to our technical staff.

Dr. Koritta
Director
Welding Research Institute
Prague, Czechoslovakia

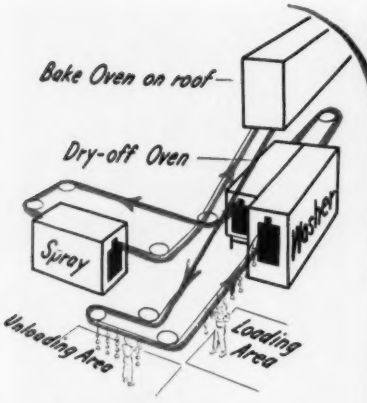
Congratulations on Coverage

Congratulations for the fine coverage on the upgrading of chemical recovery products in your article, "Chemicals from the Steel Plant" (May 13, page 128).

However, you state in the text that the Blaw-Knox Co. will market the Zahn process for regeneration of pickle liquor. This is in error since Koppers has the exclusive right to sell the process in the U.S. and Canada.

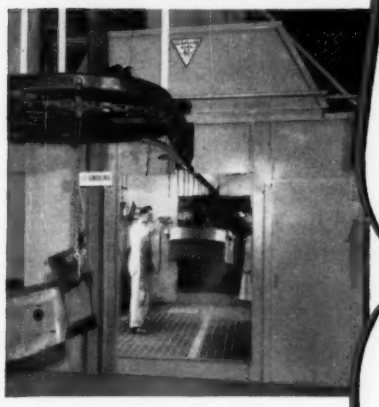
Robert A. Harper
Assistant Director
Public Relations
Koppers Co. Inc.
Pittsburgh

• *Sorry, the statement was in error. The Zahn process is attributed to Koppers in the illustration showing the flow sheet of the process and in other parts of the story.*



FLOW DIAGRAM shows perspective (not actual scale) of new metal processing and paint finishing system in Tennant's new plant. Conveyor is 500 ft. long. The 74 ft. bake oven is built on the plant's roof to save floor space. Just-sprayed parts travel up and into the oven through its underside opening. Baking lasts eight minutes at 330° F.

ALL PARTS first enter 3-stage 44 ft. washer at right, then return through 34 ft. dry-off oven at left. Note master control panel alongside dry-off oven. In washer, surface of metal parts is converted to iron-phosphate coating to prevent rust and corrosion. Temperature of dry-off oven is varied from 350 to 400° F., depending on size of parts.



CONVEYOR SPEED of 8 ft. per minute gives sprayers time to handle basket loads of small parts or large frames such as shown in photo. After prime coat is sprayed and baked on, parts go through system again (washer is temporarily shut off) for spraying and baking of the finish coat.

New 2-Tone Tennant Model "80" Sweeper

74 DIFFERENT PARTS, each twice sprayed and baked, are in this new Tennant Model "80" power sweeper for industrial use. The "80" goes anywhere, gobbling up dirt, debris, dust and litter. It features optimum design for most plants; will clean 19 out of 20 plant aisles in not more than two passes!

From 80 man-hours to 24...

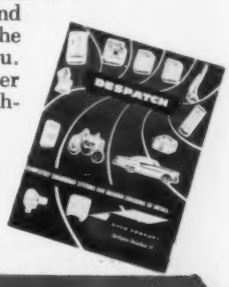
FASTER, BRIGHTER PAINTING OF 1000 DIFFERENT PARTS!

The G. H. Tennant Company, Minneapolis, used to have trouble painting production quantities of 1000 different metal parts for their power sweepers, floor machines, scarifiers, roof scrapers and concrete routers.

This new DESPATCH continuous-conveyor finishing system speeds washing and drying of *all* parts (they weigh from ounces to 800 pounds) and speeds spraying and baking of the prime coat and the bright orange or cream finish coat.

The system enables Tennant to do in 24 man-hours what used to take 80 man-hours, and assures a superior finish.

The entire system was engineered, built and installed by DESPATCH in cooperation with the Tennant Company. DESPATCH can help you. There's a DESPATCH-trained resident engineer near you. Why not talk to him about your finishing requirements?



Write today for Bulletin 51K

16 colorful pages on modern ways to achieve better finishes, faster production and smoother handling of metal products . . . at lower cost.

DESPATCH OVEN COMPANY

619 S.E. Eighth Street Minneapolis 14, Minn.

Sales and Service in All 26 Principal Cities

PIONEERS IN ENGINEERING FINISHING SYSTEMS FOR INDUSTRY

rolling taper pipe threads

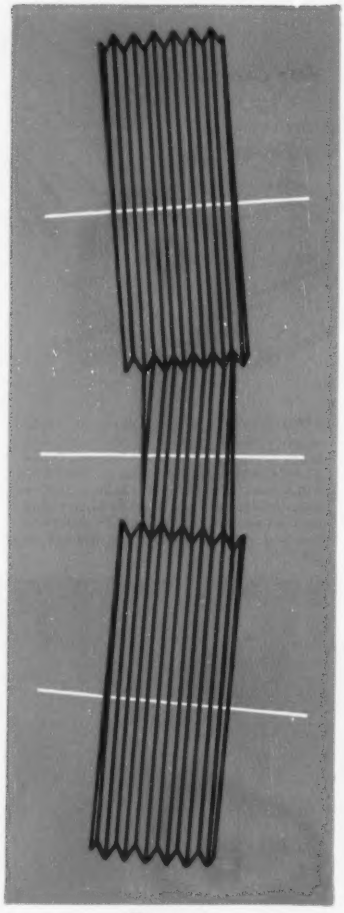
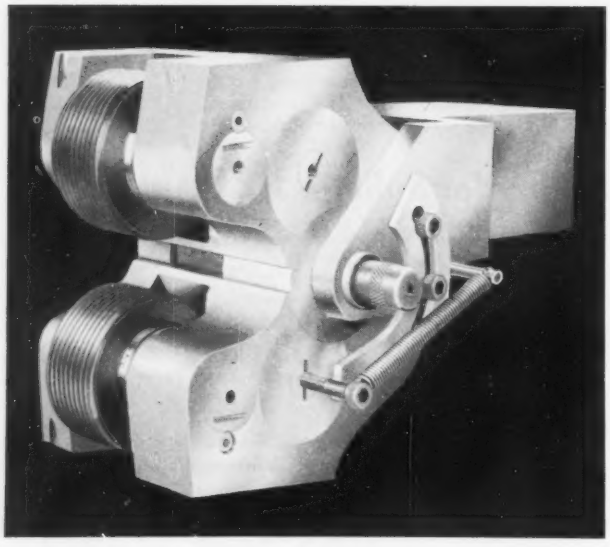


Figure 1

with the LANROLL thread rolling attachment



Thread-roll wear is minimized by the recently developed LANDIS Method (Patents Pending) for precision rolling of taper pipe threads (including dry-seal).

To produce the taper, the rolls of the LANROLL Attachment are supported on carbide shafts inclined to the required thread taper. This design enables the use of parallel rolls (see Figure 1) which reduces slippage between the workpiece and the rolls. With reduced slippage, roll life is materially increased. In addition, attachment stabilization (limited sidewise movement)

470-C

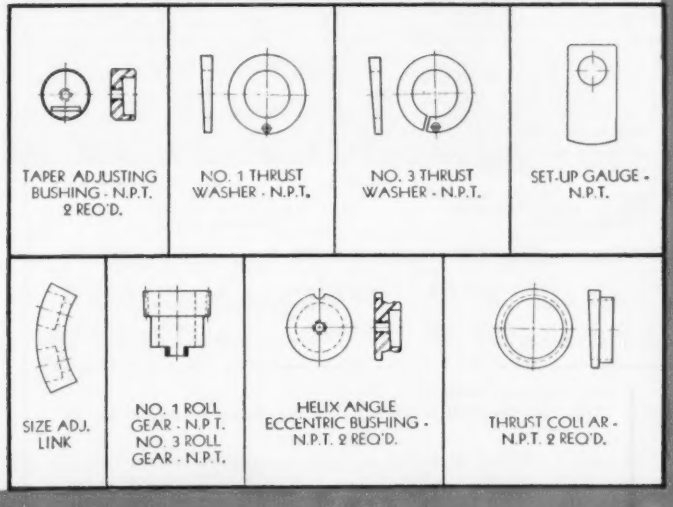
is greatly improved to permit rolling directly to a shoulder with safety.

Of an adjustable design, the LANROLL Attachments provide wide range coverage while retaining the rigidity of a non-adjustable tool. Either straight or tapered threads can now be produced with the same attachment through the use of proper rolls and auxiliary equipment. Five sizes with varying dimensions are available for use on the many sizes and makes of bar automatics, and will produce coarse pitch threads to Class 4 tolerances on all diameters from #5 to 1¾" for straight threads, and precision pipe threads from 1/16" to 1¼" in diameter.

In addition to proper rolls, the auxiliary equipment necessary to change from straight to taper threading is negligible, as illustrated in Figure 2. When changing from one pipe size to another within the range of the attachment, the size adjusting link, set-up gage and rolls are the only equipment changes required. With this design tooling flexibility is obtained with minimum cost. These changes assure operation of the attachment for every size within its range as though it were exclusively engineered for the particular work being threaded. Also, the same simplified and precise methods of set-up and roll timing used for straight threading are used for taper threading.

For additional information ask for Bulletin G-96 and specify straight or taper work.

Figure 2


TAPER ADJUSTING BUSHING - N.P.T. 2 REQ'D.
NO. 1 THRUST WASHER - N.P.T.
NO. 3 THRUST WASHER - N.P.T.
SET-UP GAUGE - N.P.T.
SIZE ADJ. LINK
NO. 1 ROLL GEAR - N.P.T.
NO. 3 ROLL GEAR - N.P.T.
HELIX ANGLE ECCENTRIC BUSHING - N.P.T. 2 REQ'D.
THRUST COLLAR - N.P.T. 2 REQ'D.

longer roll life with LANDIS parallel-roll method

Note that in producing a taper thread one end of each roll is required to thread a larger diameter than its opposite end. This results in unequal circumferential travel by the respective roll ends during each revolution. However, in traveling these unequal distances both ends of the roll make a revolution in the same interval of time. Therefore, the end of each roll on a large thread diameter must travel at a higher peripheral velocity than its opposite end on the small diameter. These necessary differentials in peripheral velocities for the roll ends can only exist by slippage between the roll and the workpiece. This slippage becomes more acute on the larger diameters as the differentials become greater or where tapered rolls on parallel axis are used. **By presenting parallel rolls to the workpiece, the LANDIS Method (see Figure 1) reduces the differentials in peripheral velocities and its accompanying roll slippage.** Roll life, of course, is greatly benefited by any reduction of slippage.

In developing a roll diameter for a particular thread, the pitch diameter of the workpiece is used as a basis. If the workpiece is straight, the relationship of the roll diameter to the workpiece diameter remains constant. For taper threads the roll diameter is normally developed from the pitch diameter at the mid-point of the effective thread. Thus, the diameter of the roll thread in respect to the diameter of the workpiece thread will only agree at one point. On either side of this point the roll diameter will be either too large or too small. This disagreement in the roll and workpiece diameter relationship results in attachment instability (sidewise movement). Maximum instability occurs if taper threads are produced with tapered rolls on parallel axis as the relationship of the roll and workpiece diameters vary in direct opposition. This instability becomes more apparent on the larger diameters as wider thread rolls having a greater disagreement are required to produce the longer thread lengths. **By use of parallel rolls on inclined axis (see Figure 1) the LANDIS Method reduces disagreement in the relationship of the roll and and workpiece diameter by one half.** In this case, both ends of each roll have a pitch diameter equal to the P.D. from which the roll was developed. Improved attachment stabilization results and rolling to a shoulder can be accomplished with safety.

LANDIS Machine COMPANY WAYNESBORO PENNSYLVANIA

there's so much to choose from at...

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Dine in the splendid old world setting of a grand dining room. The menu is varied, the service unexcelled.

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Air conditioned, of course.

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For Fabulous Roast Beef, roasted, carved and served to your order.

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TRANSIT BAR
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the PATIO
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Hotel Cleveland
CLEVELAND, OHIO

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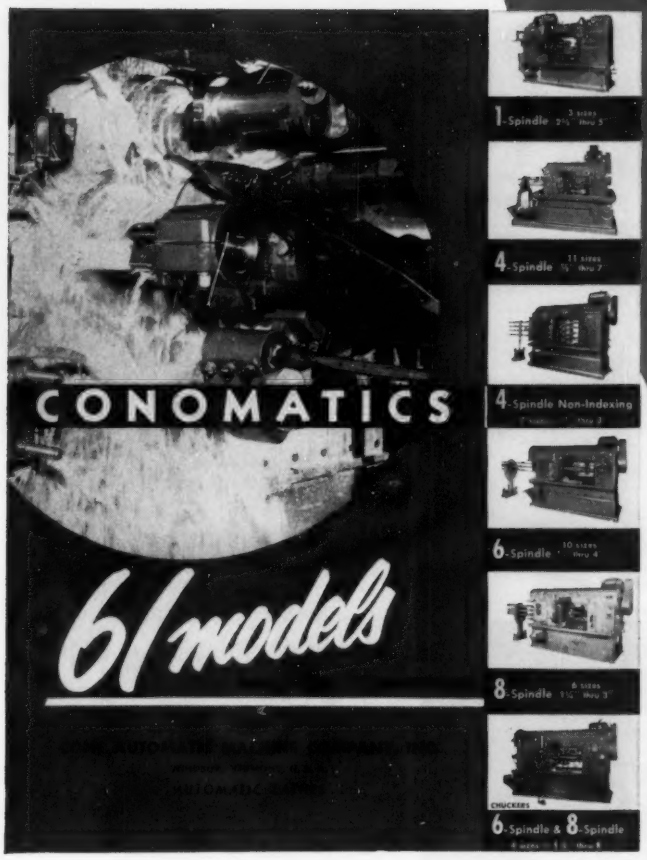

61 models

A machine not put to its best use is theoretically idle. Proper machine selection is an important factor in the profitable use of a multiple spindle automatic. So extensive are the demands on this type of lathe that no single model—or number of models—can be expected to efficiently handle the wide range of work available.

To excel in any range of work a multiple spindle automatic must be specifically designed for that range. That is why CONOMATICS are provided in so many models. In no other way can the purchaser be assured of the best possible machine for his particular requirements.

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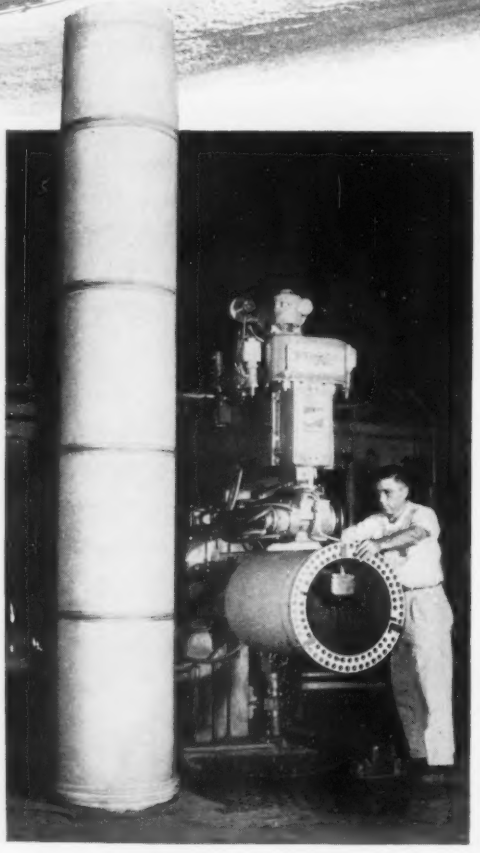
CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U.S.A.

HEAT • WEAR • CORROSION

HAYNES Alloys solve the

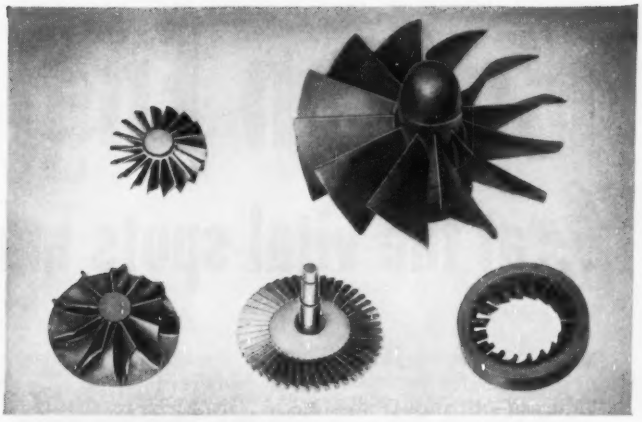


HEAT

2,000 degree jet blast!

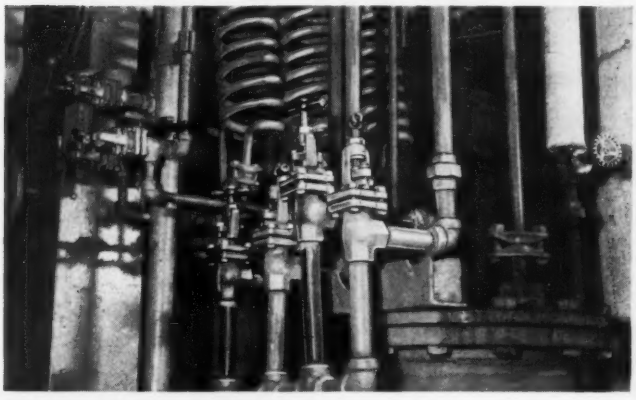
The jet engine tailpipe of the Navy's A4D "Skyhawk" operates at extremely high temperatures. That is just one of the many reasons why this part is made of MULTIMET alloy. This is one of 6 HAYNES wrought alloys that have unusual resistance to high temperatures and oxidation. Because of their exceptional properties, HAYNES alloys are being used extensively in such parts as after-burner components, jet engine tailpipes, turbine blades, and nozzle vanes.

tough problems



PRODUCTION Intricate turbine wheels mass-produced.

HAYNES' investment-casting method offers a selection of alloys developed for economical operation over a wide temperature range. Blades and wheels are produced as one integral part to as-cast tolerances that permit operation with unusually fine clearances at high speeds.



CORROSION Withstands corrosive chlorine 10 years!

Handling highly corrosive liquid chlorine was an expensive maintenance problem—until valves made of HASTELLOY alloy C were installed. This is just one of the many corrosive difficulties met by HAYNES Alloys. They also have excellent resistance to hot mineral acids, strongly oxidizing salts, and powerful gaseous oxidants over a wide range of temperatures and concentrations.

If you have an application that is creating a tough heat, wear, or corrosion-resistance problem, you will find it profitable to check with HAYNES Stellite Company. In practically every industry, you will find HAYNES Alloys doing a better job, lasting longer, reducing maintenance and proving most economical.

Tell us your problem and we will send you descriptive literature on the HAYNES Alloy best suited to solve it. Write HAYNES STELLITE COMPANY, Division of Union Carbide Corporation, General Offices and Works, Kokomo, Indiana.

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Morgan Engineering Co.

...at the vital spots maintaining continuous,

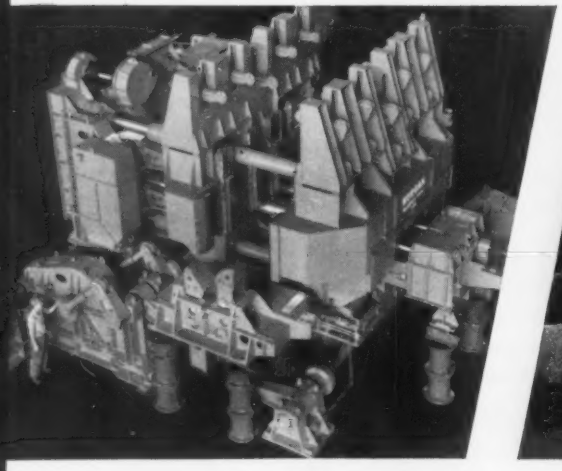
Wherever steel is made, huge blocks of metal are worked or great weights must be lifted, you find the nameplate . . . "Morgan—Alliance, Ohio—USA"... famous for advanced design in cranes since 1878.

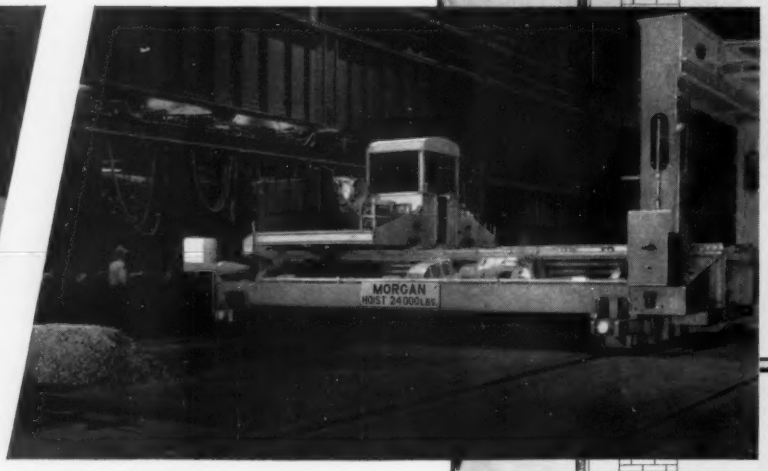
Today, through years of far-sighted research and sound engineering, many other types of Morgan mill equipment are equally well known. Mills, roller tables, shears, saws, presses and auxiliary equipment built by Morgan offer the same fine performance standards.

New speeds and efficiency, greater capacities, lower operating and maintenance costs are characteristic of all Morgan-built equipment. Each design advance reflects close contact with your requirements . . . and Morgan Engineering Company's unusual talent for anticipating and

FREE REPRODUCTION—*A 14" x 20" reproduction of this 1888 Morgan Engineering drawing is available for framing. Kindly mail request on company letterhead.*

TODAY *you find the name "Morgan" on all types of mill equipment . . . handling the big jobs and the tough ones. Shown below: open hearth charging machine and gag straightener for 36" beams.*

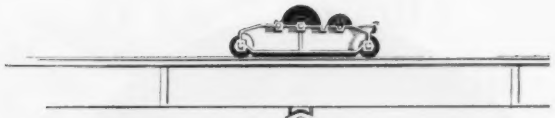




lower cost production

solving problems of the fast-growing metals industry.

Quality craftsmanship in every detail is a tradition that pays off in efficient, uninterrupted production in your mill operations. Let our representative show *you* how to speed production and lower costs with Morgan mill equipment.

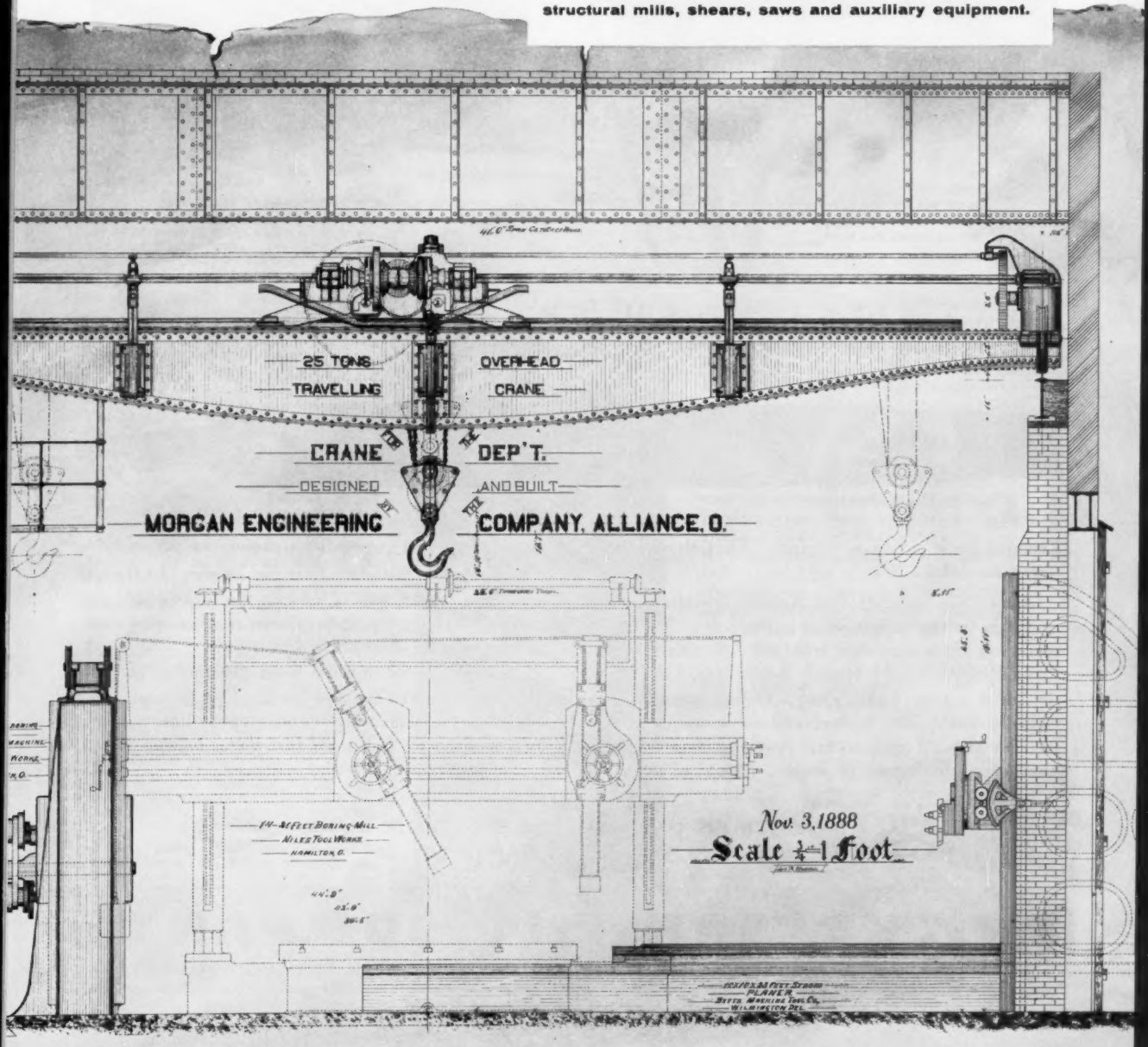


THE

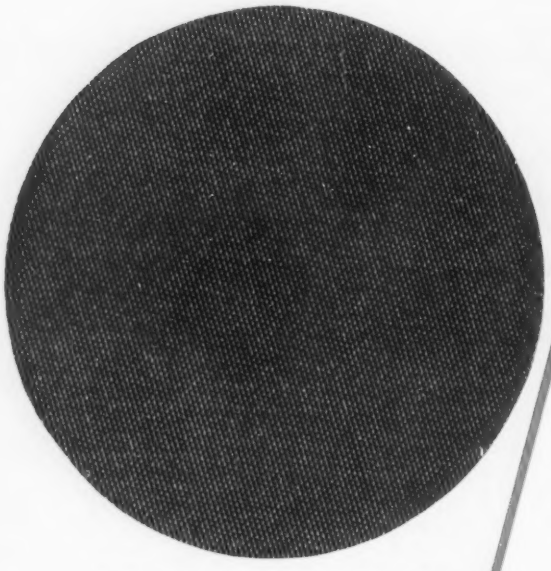
MORGAN

ENGINEERING CO. *Alliance, Ohio*

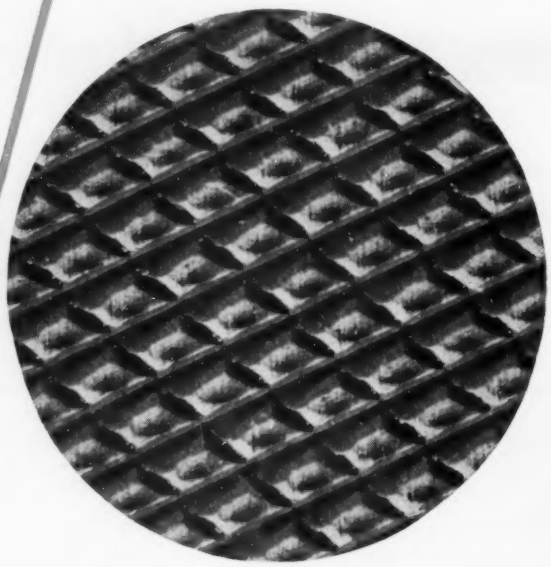
Overhead electric traveling cranes, gantry cranes, open hearth special cranes, plate mills, blooming mills, structural mills, shears, saws and auxiliary equipment.



For the finest jobs...or the roughest jobs

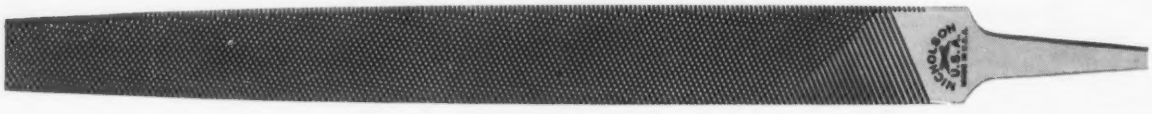


Tooth pattern of Nicholson-made Swiss Pattern Square Handle Needle file, Cut No. 6, magnified approximately five times.



Tooth pattern of Nicholson-made 18-inch Flat Bastard file magnified approximately five times.

There is a Nicholson and Black Diamond file for every purpose



Examine these close-ups carefully. They show several important points.

First, they indicate that Nicholson-made files are available in the widest spectrum of cuts. The cross section at left is magnified from our X.F. (*Ex*tra *F*ine) Swiss Pattern Square Handle Needle file, Cut No. 6, the finest cut we make. Our X.F. files are primarily finishing tools, used by tool and die makers, delicate instrument parts finishers and jewelers. And there are *seven* separate degrees of fineness instead of the three usually found in conventional American pattern files.

The section at right is from our 18-inch Flat Bastard file. This rugged tool is used by machinists, ship and engine builders, repair men—any worker who wants to take off a lot of metal in a little time.

And notice the uniform tooth structure of both the fine Swiss Pattern cut and the big Flat Bastard. Fine Nicholson workmanship means top results for you. *Your dependable Industrial Distributor has the Nicholson or Black Diamond files you need.*

NICHOLSON U.S.A. **NICHOLSON FILE COMPANY, PROVIDENCE, RHODE ISLAND** BLACK DIAMOND U.S.A.

(In Canada: Nicholson File Company of Canada Ltd., Port Hope, Ontario)

NICHOLSON FILE COMPANY

World's foremost manufacturer of A FILE FOR EVERY PURPOSE

CALENDAR
OF MEETINGS

June 3-5, American Management Association: General management conference, Hotel Statler, New York. Association's address: 1515 Broadway, New York 17, N.Y. Secretary: Andrew P. Donovan.

June 3-7, American Society of Civil Engineers: National spring convention, Hotel Statler, Buffalo. Society's address: 33 W. 39th St., New York 18, N.Y. Executive secretary: William H. Wisely.

June 4-7, National District Heating Association: Annual meeting, Homestead, Hot Springs, Va. Association's address: 827 N. Euclid Ave., Pittsburgh 6, Pa. Secretary-treasurer: John F. Collins Jr.

June 9-12, National Industrial Advertisers Association: Annual meeting, Waldorf-Astoria hotel, New York. Association's address: 271 Madison Ave., New York 16, N.Y. President: John C. Freeman.

June 9-12, National Metal Trades Association: Western plant management conference, Dell View hotel, Lake Delton, Wis. Association's address: 337 W. Madison St., Chicago 6, Ill. Secretary: Charles L. Blatchford.

June 9-13, American Society of Mechanical Engineers: Semiannual meeting, Sheraton-Palace hotel, San Francisco. Society's address: 29 W. 39th St., New York 18, N.Y. Secretary: C. E. Davies.

June 10-11, Magnesium Association: Summer meeting, Homestead, Hot Springs, Va. Association's address: 122 E. 42nd St., New York 17, N.Y. Executive secretary: Jerry Singleton.

June 11-13, Western Plant Maintenance & Engineering Show: Civic Auditorium, San Francisco. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17, N.Y.

June 13-14, Malleable Founders' Society: Annual meeting, Broadmoor hotel, Colorado Springs, Colo. Society's address: 1800 Union Commerce Bldg., Cleveland 14, O. Executive vice president: Lowell D. Ryan.

June 14, Pressed Metal Institute: National sales conference for metal stampers, Carter hotel, Cleveland. Institute's address: 3673 Lee Rd., Cleveland 20, O. Managing director: H. A. Daschner.

June 14-16, Steel Kitchen Cabinet Manufacturers Association: Annual meeting, Greenbrier, White Sulphur Springs, W. Va. Association's address: 1008 Engineers Bldg., Cleveland 13, O. Executive secretary: Arthur J. Tuscany Jr.

June 16-17, National Association of Metal Finishers: Annual meeting, Sheraton-Mt. Royal hotel, Montreal, Que. Association's address: 60 Bently Rd., Cedar Grove, N.J. Secretary: P. Peter Kovatis.

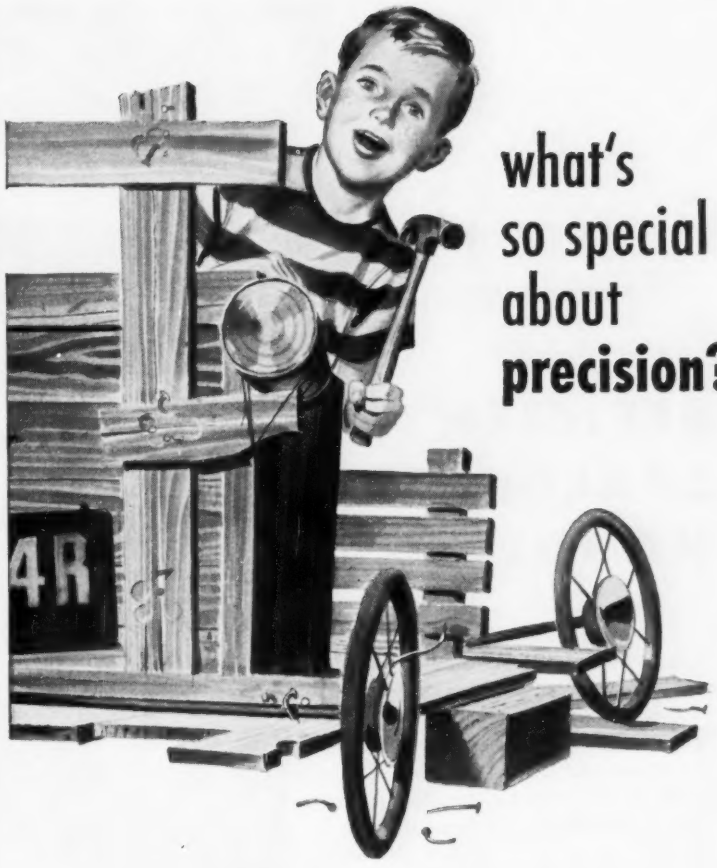
June 16-20, American Electroplaters Society: Annual meeting, Sheraton-Mt. Royal hotel, Montreal, Que. Society's address: 445 Broad St., Newark 2, N.J. Secretary: John P. Nichols.

June 16-21, American Society for Testing Materials: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N.J. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

June 18-20, Triple Industrial Supply Convention: Mark Hopkins hotel, San Francisco. Information: W. B. Thomas, 2130 Keith Bldg., Cleveland 15, O.

June 19-21, American Marketing Association: Annual meeting and exhibit, Hotel Statler, Detroit. Association's address: 27 E. Monroe St., Chicago, Ill. Executive director: William C. Gordon Jr.

June 19-22, Drop Forging Association: Annual meeting, Grand hotel, Mackinac Island, Mich. Association's address: 419 S. Walnut St., Lansing 33, Mich. Secretary-treasurer: Richard Marcus.



what's so special about precision?

To this little fellow building the 1957 "dream car", precision is a bent nail or a split board. To modern automotive engines and aircraft power plants, PRECISION is a most important element.

That is why CHANDLER specialists are working harder than ever to supply cap screws to closer tolerances to meet your new requirements. Chandler is producing the finest fasteners today in all of its 25 years of experience. Chandler is specializing in mass production of bolts from high alloy steels . . . with special heads or threads . . . with drilled heads or shanks . . . ground to close tolerances . . . and with threads rolled after heat treating.

There is a Chandler cold wrought fastener to meet your specifications. And remember, at Chandler . . . there is nothing special about PRECISION because we do it every day.

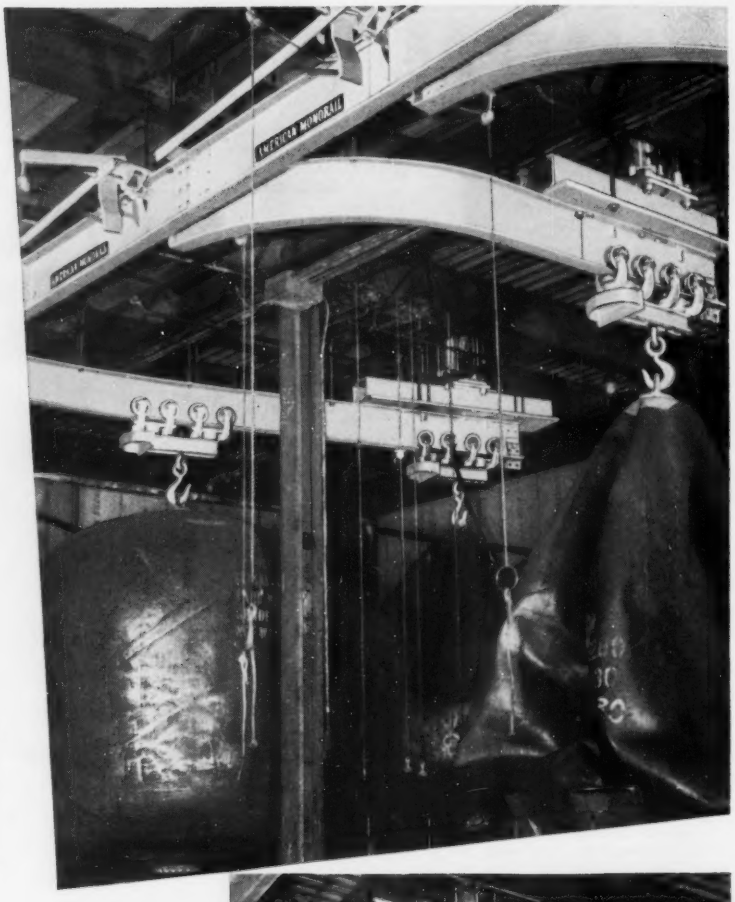
6SE-CH

Write today for Bulletin 1264-CH

CHANDLER PRODUCTS CORPORATION

1488 CHARDON ROAD • CLEVELAND 17, OHIO

Teamed Engineering for EFFICIENT SEALDBULK HANDLING



U. S. Rubber Company and American MonoRail Engineers teamed up to develop this system.

The Sealdbin containers, a product of U. S. Rubber Co., each hold 11,000 pounds of costly carbon black. This American MonoRail System moves the Sealdbins from flat cars or trucks to special stations for discharge. Empty deflated containers are returned to the supplier for re-use.

Working together this expert team has minimized manual labor, time, and waste.

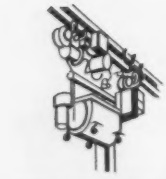
If you have a materials handling problem, call your nearby MonoRail Engineer or write us.

Send for Bulletin C-1.

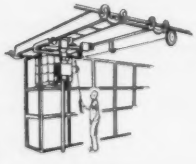
US RUBBER

Member of Materials Handling Institute and MonoRail Mfrs. Assn.

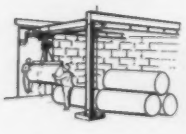
For Power Driven Conveyors, Use Landahl Chainless Conveyors



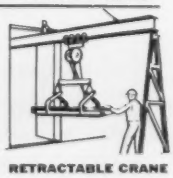
AUTOMATIC DISPATCH



STACKER CRANE



MANUAL MONORAIL



RETRACTABLE CRANE

AMERICAN MONORAIL COMPANY

OVERHEAD HANDLING EQUIPMENT

13102 ATHENS AVENUE • CLEVELAND 7, OHIO

(IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.)

Wean, Fairless and Tinplate

WHEN U. S. Steel conceived the idea for their Fairless Works they wanted the fastest, most modern lines possible. But, more important, they wanted equipment that would improve product quality.

That's why, when they began thinking tinplate, they came to Wean — the world's foremost designer of electrolytic cleaning and tinplate equipment. In conjunction with U. S. Steel engineers Wean produced a continuous tinplate line that has established records for both speed and product quality.

If you're thinking tinplate — remember 75 per cent of all tinplate produced by the electrolytic process is made on Wean engineered lines.

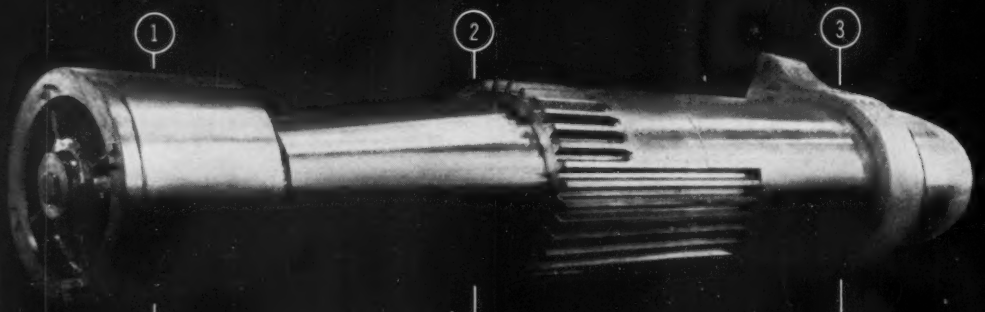
THE WEAN ENGINEERING COMPANY

WARREN, OHIO

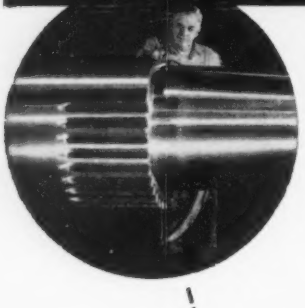
ROUTINE *at...*

ERIE FORGE & STEEL!

Complete Forged and Cast Steel Assembly
for Electric Furnace Roof Lifting Ram . . .



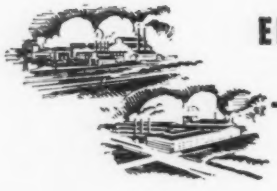
1. Cast Steel Roof Lifting Piston Head Gland Ring and Cap Assembly 2990 pounds.
2. 55,700 pound forged alloy steel Roof Lifting Ram.
3. Cast steel roof ram buttress 3880 pounds.



This roof lifting ram used by a leading builder of electric melting furnaces was manufactured and assembled complete by Erie Forge & Steel Corporation. The steel castings were poured in our own steel foundries. The steel for the forging was made and forged in our own shops. These components were machined, keyways finished, and the whole assembled within our own plants here in Erie.

Close metallurgical control of every step in foundries and forge shops results in unquestioned quality. Careful supervision in machine shops and final assembly . . . these *routine* procedures give practical meaning to our often repeated, "Here your steel castings and forgings are followed closely from raw materials to finished product under 'One Responsibility and One Control'". Place your component parts requirements with us, fully confident of the results you expect.

•



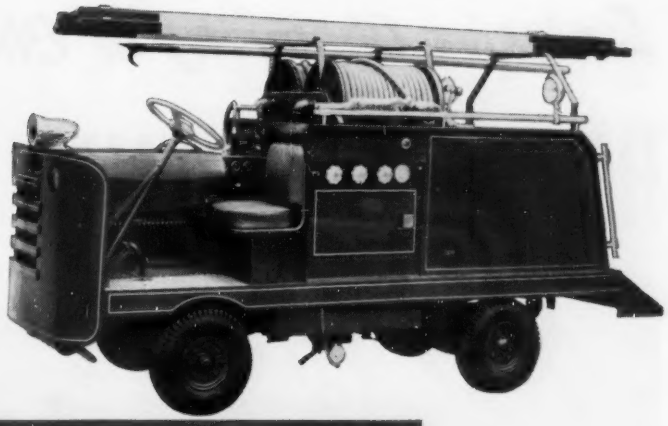
ERIE FORGE & STEEL CORPORATION

ERIE, PENNSYLVANIA

MEMBER AMERICAN IRON AND STEEL INSTITUTE

ERIE FORGE & STEEL CORPORATION

factory fire fighter



The John Bean aisle-sized fire engine fogs out industrial blazes instantly! *Highly maneuverable*, it can speed directly to inplant fires taking 90° turns from one 8-foot aisle into another, climbing 16% grades fully loaded. *Highly efficient*, its high pressure fog equipment smothers flames with only 10% of the water required by ordinary systems, and with comparably less water damage. *Completely dependable*, it is powered—both the truck (built by HH Manufacturers) and the pump—by a big-output, low-cost Chrysler Industrial Engine.

CHRYSLER INDUSTRIAL 30

in-line 6 Engine (230 cu. in. displacement) powers John Bean Industrial Fire Fighter—and many other makes of equipment in the industrial, construction and materials handling fields. There are four Chrysler in-line 6s, two V-8s—ranging from 230 to 354 cu. inch displacement.

Chrysler

INDUSTRIAL ENGINES

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

Write Dept. D-6, Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan, or see your nearest Chrysler Industrial Engine Dealer.

☐ For specific detailed information ☐ For descriptive literature

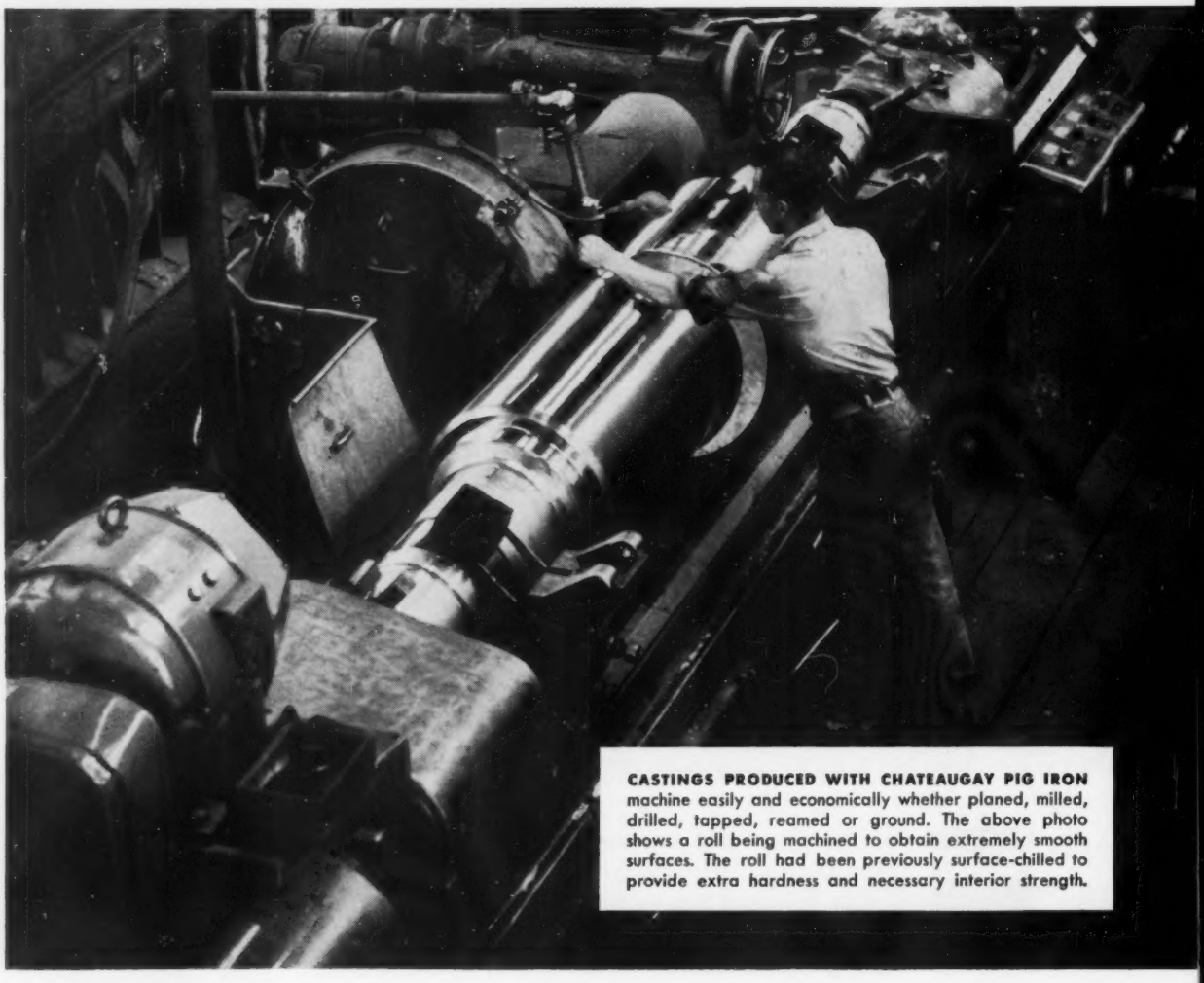
NAME

ADDRESS

CITY ZONE STATE

Exclusive Chemistry of Chateaugay Pig Iron

HELPS FOUNDRYMEN MEET EXACTING



CASTINGS PRODUCED WITH CHATEAUGAY PIG IRON machine easily and economically whether planed, milled, drilled, tapped, reamed or ground. The above photo shows a roll being machined to obtain extremely smooth surfaces. The roll had been previously surface-chilled to provide extra hardness and necessary interior strength.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

REQUIREMENTS

For more than 50 years, foundrymen have used Republic Chateaugay Pig Iron to help them lick the tough casting jobs. They know Chateaugay's properties and characteristics are unequalled by any domestic pig iron. They also know that Chateaugay can be depended upon to meet the most exacting casting requirements.

The rolls used in the manufacture of paper, plastics, rubber, metals of all kinds, steel, copper, brass, aluminum, even breakfast cereals, are a good example of how Chateaugay lives up to its reputation.

Foundries producing these rolls have found Chateaugay the ideal pig iron to use in meeting the demands for hard, wear-resisting surfaces; for strength; for heat-resistance; for machinability.

One foundryman put it this way: "Chateaugay is indispensable in this application because of its finer graphite structure and grain refinement. The exclusive inherent chemistry of Chateaugay tends to nucleate the fine graphite flakes, producing a finer, condensed grain structure that gives the rolls increased strength and wear-resistance."

This fine dense grain structure also provides excellent and economical machinability and reduces scrap loss to an absolute minimum.

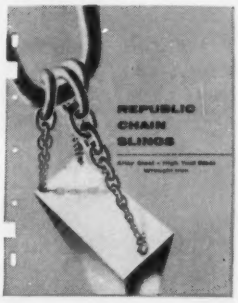
Chateaugay offers other superior characteristics which make it ideal for a wide variety of casting applications. It is an exceptionally fluid iron—cools evenly—fills adjoining light and heavy sections completely—produces tough, sound castings accurate to patterns and shapes.

A Republic Pig Iron Metallurgist will be glad to show you how the advantages of Chateaugay, the low-phosphorus, copper-free Pig Iron, can be applied to your production. How the year-in, year-out uniform chemistry of Chateaugay can help you produce consistently high quality castings. Mail the coupon today. There's no obligation.

STEEL

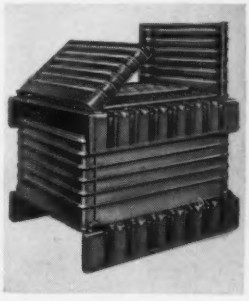
and Steel Products

MEETS LIFTING REQUIREMENTS—Republic Chain Slings provide a safe method of lifting heavy and hard-to-manage materials. This new catalog contains complete information and specifications on Republic Chain Slings, Attachments and Accessories. Tells you how to use slings properly to obtain maximum life...how to store...how to inspect...how to order. Send the coupon for your copy.



MEETS STRENGTH REQUIREMENTS TO WITHSTAND ENORMOUS WEIGHTS—Republic Wedge-Lock Steel Shelving is specifically designed for high stacking of such heavy items as castings, dies, tools, etc. Joints actually get tighter as weight increases. There's no distortion or instability. Wedge-Lock Steel Shelving also provides maximum loading in minimum floor space and assembles quickly and easily. Send coupon for more facts.

MEETS STRONG CONSTRUCTION REQUIREMENTS — Republic Materials Handling Equipment assures long, efficient service at lowest per-year cost. Illustrated is the PB-127 Collapsible Box, ideally suited to shipping castings and other heavy items. It is designed for heavy-duty service. It can be tiered when loaded or empty, collapsed or set up. All parts are permanently attached. Offers up to 66% saving in storage space. Write for facts.



REPUBLIC STEEL CORPORATION
Dept. C-2919
3120 East 45th Street, Cleveland 27, Ohio

☐ Please have a Pig Iron Metallurgist call.
Send more information on:
☐ Chain Sling Catalog ☐ Wedge-Lock Steel Shelving
☐ Collapsible Boxes

Name_____ Title_____
Company_____
Address_____
City_____ Zone____ State____

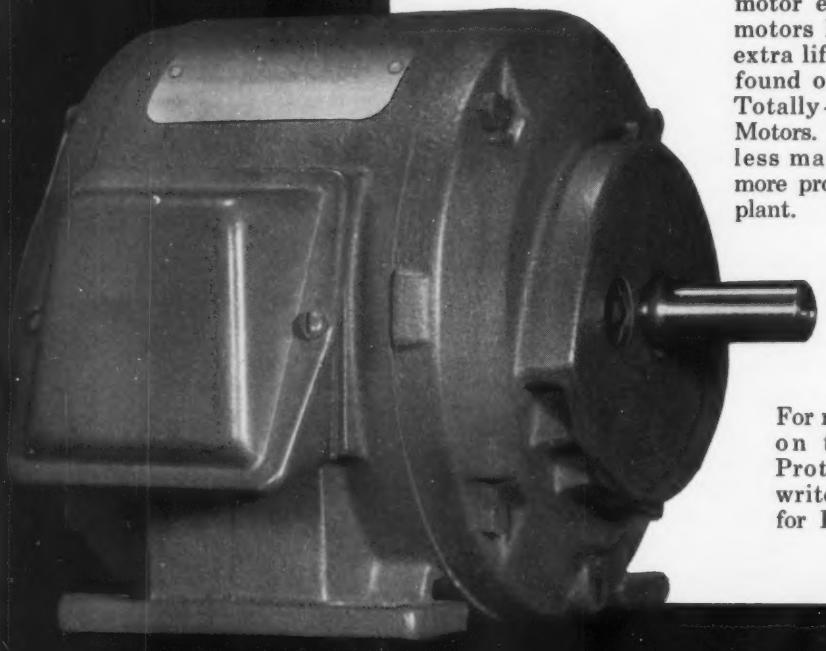
the world's only

TOTALLY-PROTECTED MOTOR

When we speak of Totally-Protected, we mean superior frame design with rigidity for heavy load conditions. We mean Metermatic bearing lubrication, acid and oil-proof insulation system, and motor leads, labeled and sealed in neoprene.

Totally-Protected means all this and more, but most of all it means a new concept of motor design and construction.

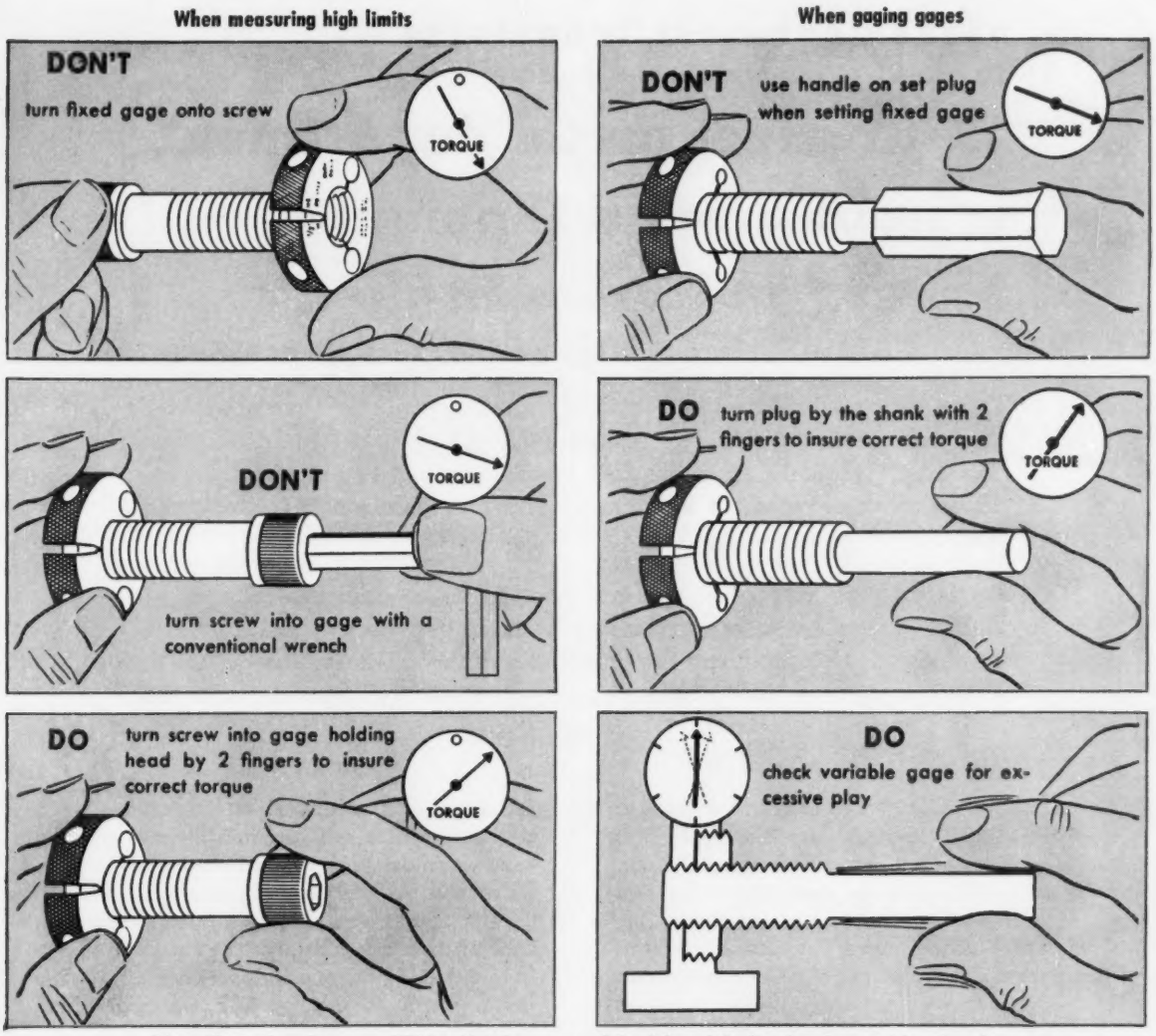
This Totally-Protected concept brings you a new motor efficiency. These motors have a built-in extra life—an extra life found only in Reliance Totally-Protected A-c. Motors. You profit from less maintenance and more production in your plant.



For more information on this Totally-Protected concept, write to Dept. 46A for Bulletin B-2401.
(B-1543)

RELIANCE R ELECTRIC
AND ENGINEERING COMPANY

CLEVELAND 17, OHIO · CANADIAN DIVISION: WELLAND, ONT.
Sales Offices and Distributors in Principal Cities



These illustrations from new SPS booklet show some of the do's and don'ts of gaging precision threads.

3A threads: what they are; how to gage them — new SPS booklet tells all

Threads made to Class 3A fit are the most precise in general use in industry. But you do not always get the 3A precision you specify. Because of many different gaging techniques that yield varying results, screws with threads well outside the Class 3A tolerance limits often pass inspection.

SPS has prepared a new booklet on this subject. It explains clearly what Class 3A threads are and the pros and cons involved in the widely varying gaging techniques in use today. It reviews the gaging of high and low limits of 3A threads, sampling techniques, and even the methods of gaging gages.

All standard UNBRAKO socket screw products fall within specified tolerance limits *no matter what method is used to gage them.* Leading industrial distributors carry complete stocks. Unbrako Socket Screw Division, STANDARD PRESSED STEEL Co., Jenkintown 33, Pa.

Form 2239, "Class 3A Threads: what they are; how to gage them." 16 pages, with many illustrations. Write for free copy today.

STANDARD PRESSED STEEL CO.

UNBRAKO SOCKET SCREW DIVISION SPS

JENKINTOWN PENNSYLVANIA

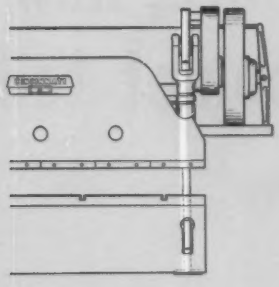
DETREX CHEMICAL INDUSTRIES *say:*

"Our sheet metal department is built around Cincinnati Shears and Press Brakes."

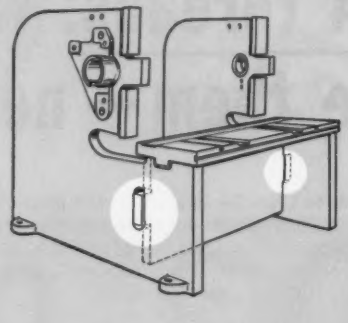
Three Cincinnati Shears and two Cincinnati Press Brakes are operating profitably in this finely equipped shop. All of the sheet steel parts needed to fabricate an entire line of drycleaning equipment are produced on these versatile machines. The materials range in thickness from No. 16 gauge to 3/8".

An interesting feature of this application is the adjustable handling "table" made by inserting ball-transfers into prepared holes in the plant floor. Plugs cover the holes when they are not being used. This system solves the problem of getting a variety of pieces from the Shears to the Press Brakes.

Centerline Loading is a standard feature of all Cincinnati Press Brakes. Since working forces are contained directly in the housings, weaving of the frame and cramping of the ram slides, guides and shaft bearings are eliminated. Centerline loading makes it possible to concentrate most of the weight of a Cincinnati Press Brake in the four main members, which provides maximum strength per pound of machine. Write Department C for Catalog B-4R, which gives full details.



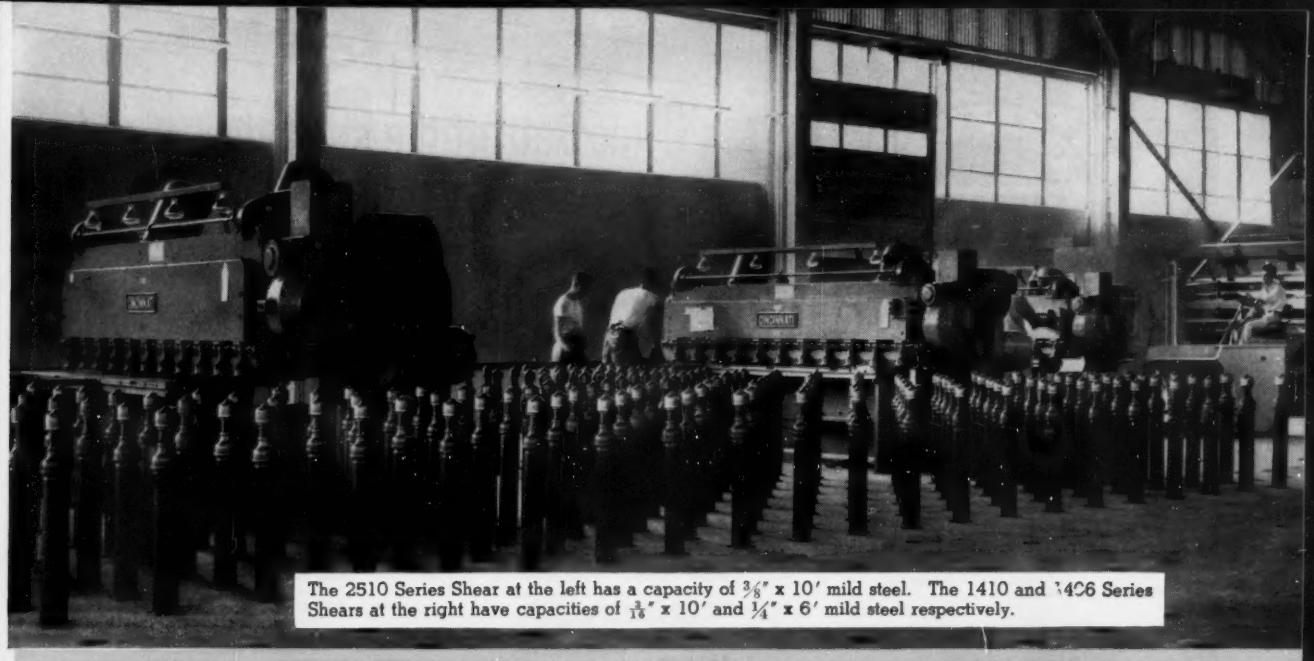
All-Steel, Interlocked Construction is a standard feature of Cincinnati Shears. All the main members are of rolled steel plate, yet no welds are used as load supports. In addition to eliminating strains which affect accuracy, Cincinnati interlocked construction also reduces freight, foundation and installation costs. Write Department C for Catalog S-7R, which gives full details.



CINCINNATI

THE CINCINNATI SHAPER CO.

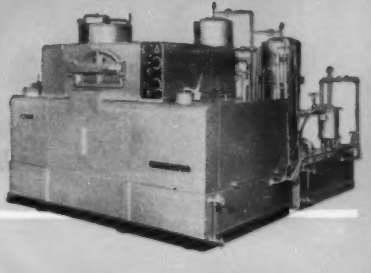
CINCINNATI 25, OHIO, U.S.A. SHAPERS · SHEARS · PRESS BRAKES



The 2510 Series Shear at the left has a capacity of 3/8" x 10' mild steel. The 1410 and 1406 Series Shears at the right have capacities of 5/16" x 10' and 1/4" x 6' mild steel respectively.

The two 13 Series Cincinnati Press Brakes have a bending capacity of 250 tons. The machine in the foreground is equipped with air-electric clutch control, and both machines are equipped with load indicators.

Photographs courtesy Detrex Chemical Industries, Inc., Bowling Green, Kentucky.



This two-bath Ambassador Model 600S drycleaning machine is typical of the Detrex line of quality equipment produced with the aid of Cincinnati Shaper Company machines.

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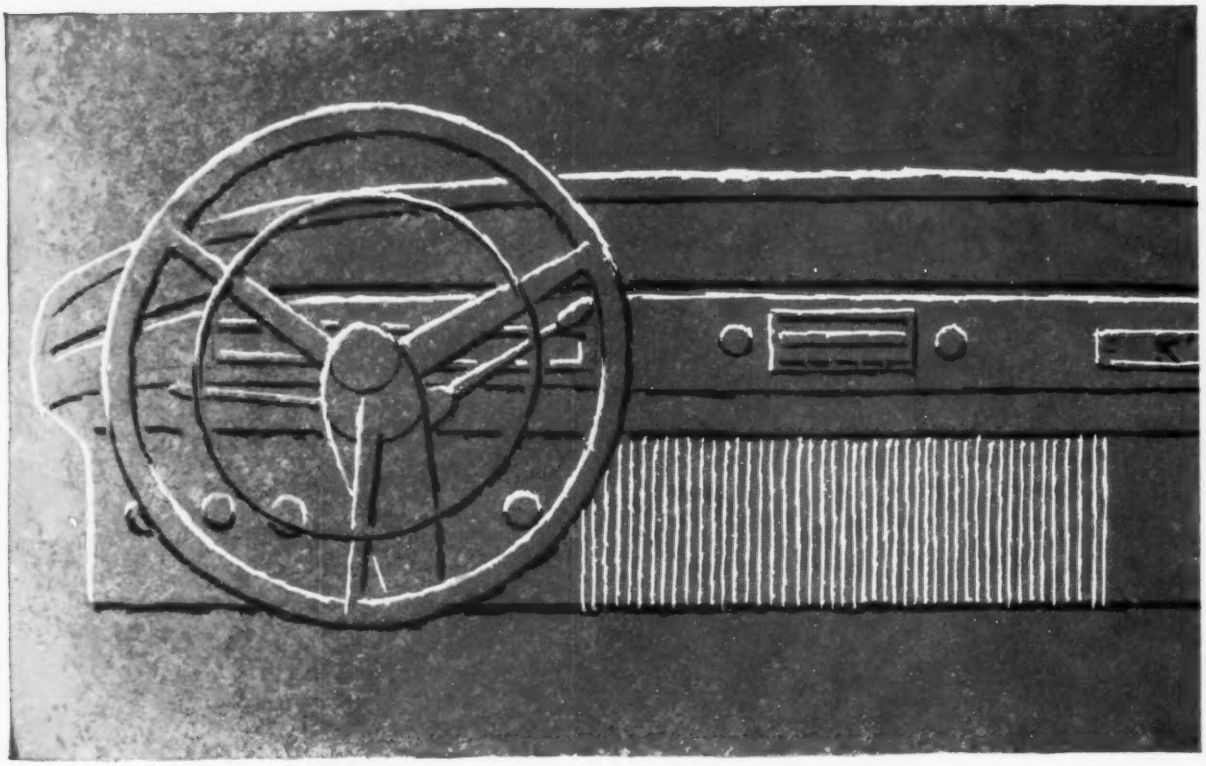

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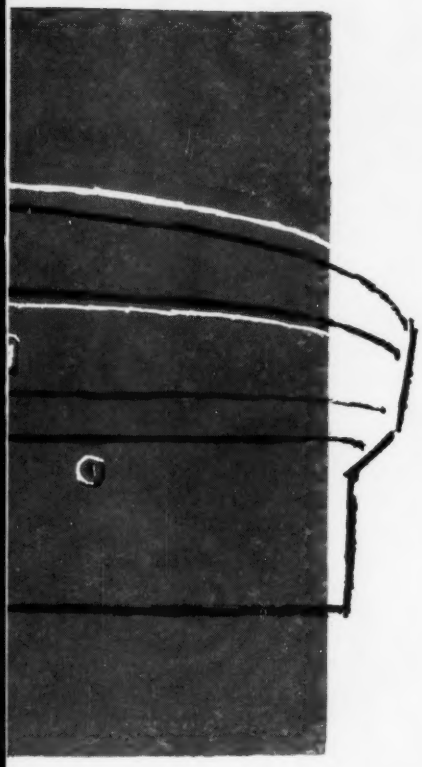

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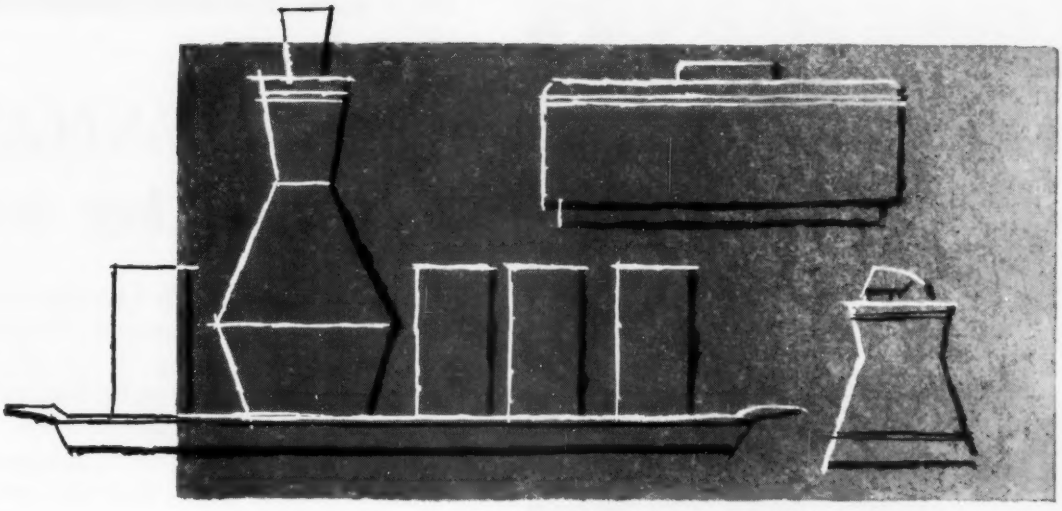

Call any sales office of American Steel & Wire for more information about the availability and uses of Amerstrip in carbon, alloy, or stainless grades.

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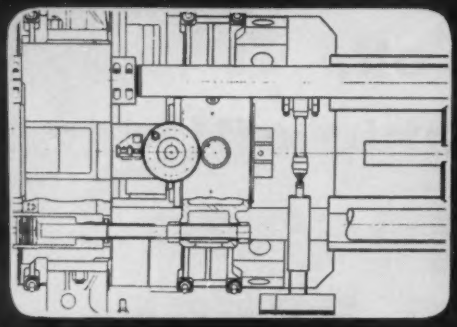

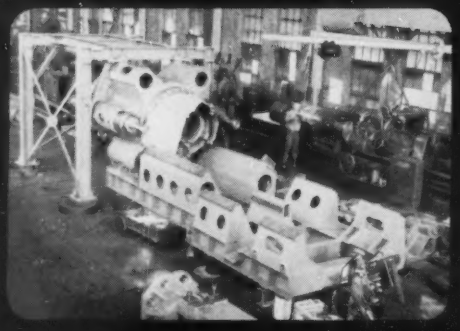

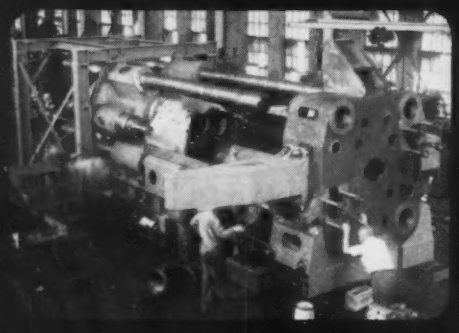

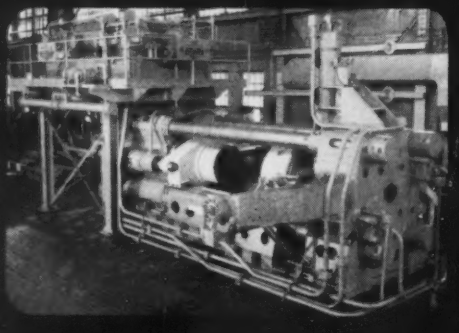

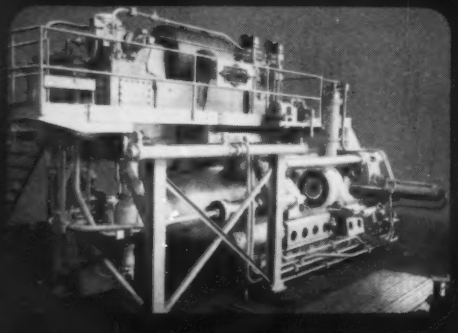

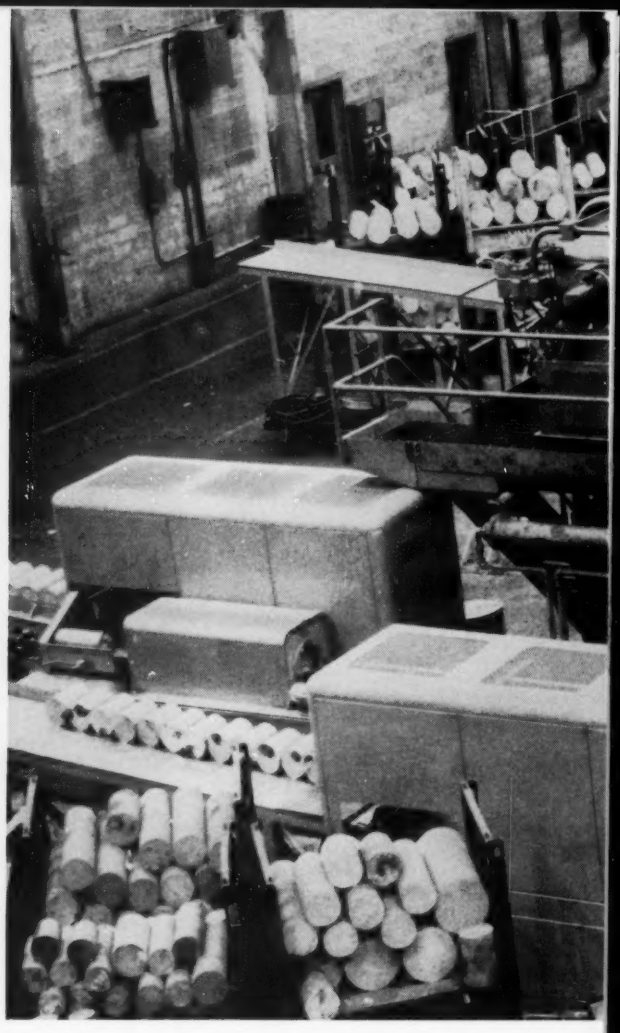

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gets big boost

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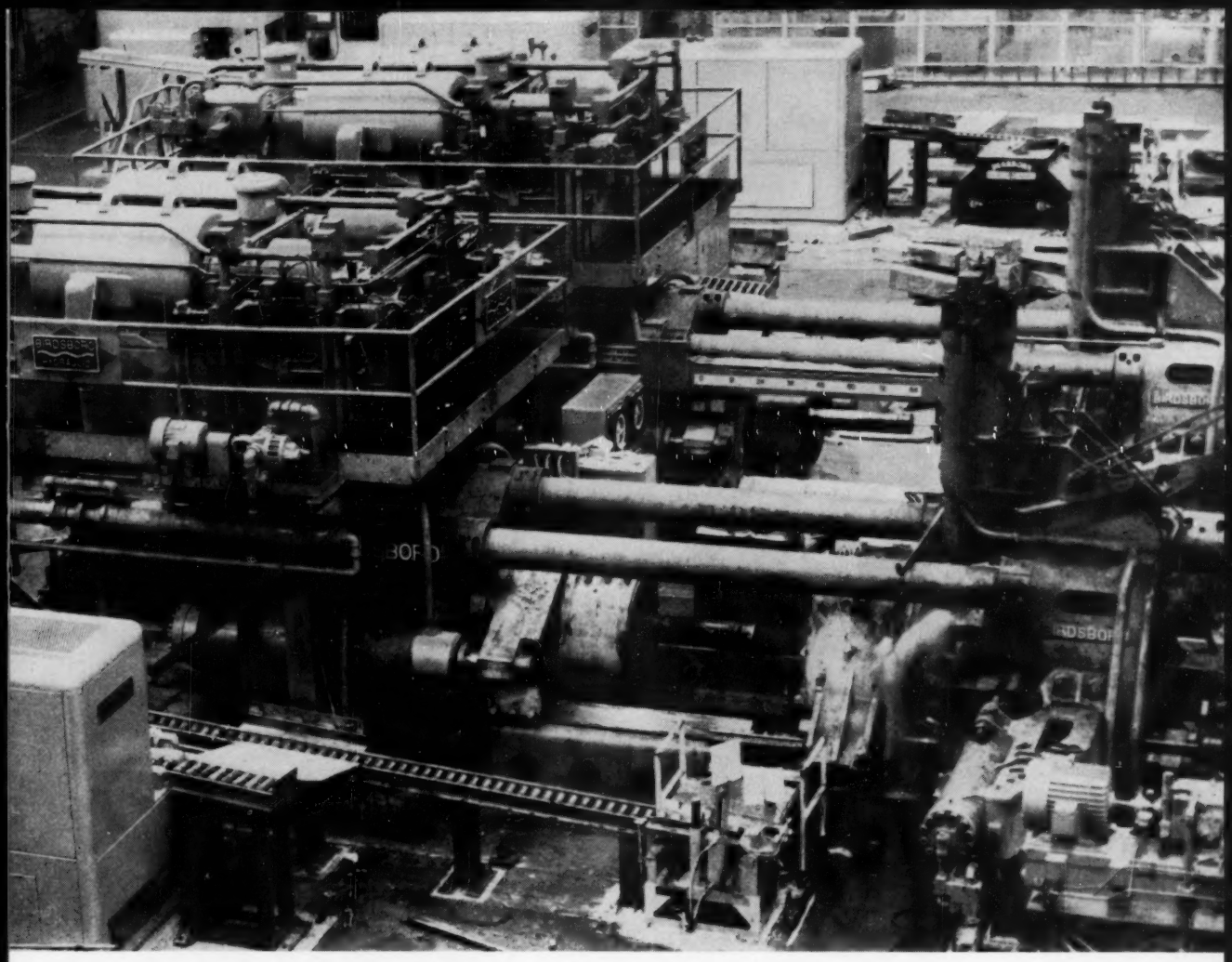
Here are a few of many stages from blueprint to assembly in the construction of the extrusion presses pictured above.



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Here are details as reported in "Kaiser Aluminum NEWS":

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"Heaviest new unit in the line is a 3,500-ton water hydraulic press, also built by Birdsboro."

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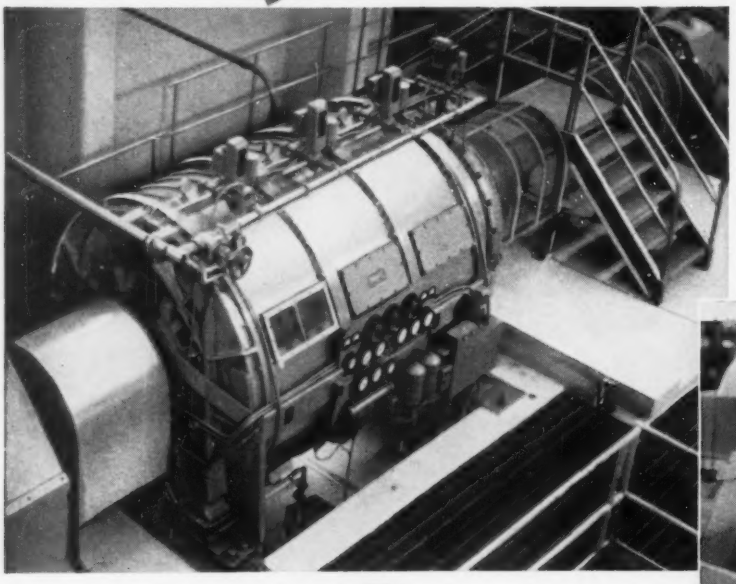
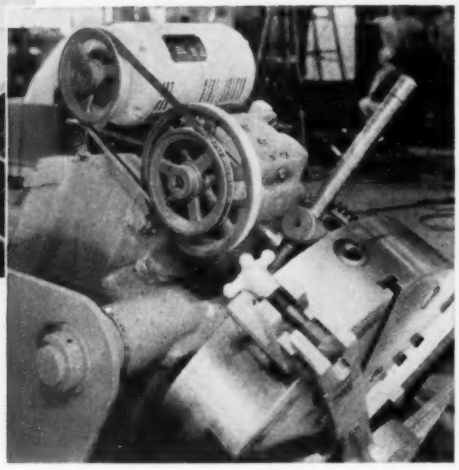


OR

1/4 HORSEPOWER



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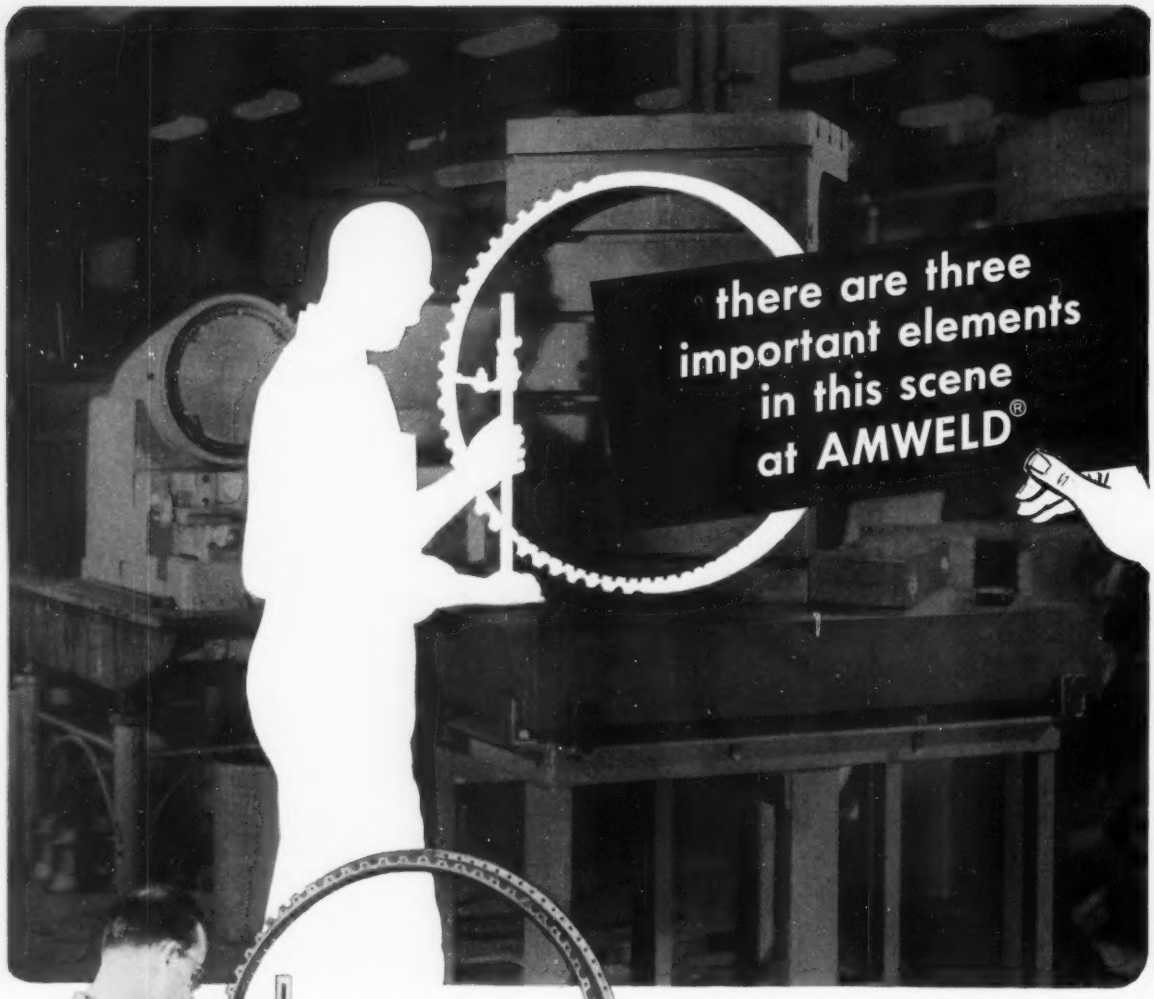

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Metalworking Outlook

The Right-to-Work Laws

The shrillness of attacks in the labor press on right-to-work laws hints a growing fear by labor that the union shop will be prohibited nationally. Eight proposals are before Congress on the issue. Four would prohibit the union shop nationally. Four would make the state right-to-work laws illegal and thus give a big boost to the union shop. Eighteen states have right-to-work, but only Indiana is heavily industrialized. Eighteen have defeated such legislation, five being industrial areas. Pro and con pressure is on the 12 uncommitted legislatures. Prospects: No national legislation on the matter in 1957, but one or two farm states may approve right-to-work by year end.

Labor Tightens Up

Look for less autonomy among labor unions. Because of the Beck affair, top AFL-CIO officers will quietly tighten controls on their 140 affiliates. One way will be by withholding membership on the AFL-CIO council from candidates who don't toe the line. Watch, too, for tighter audits of union funds, more supervision of local elections. The AFL-CIO has scrapped its organization drive for this year, is soft-pedaling its legislative campaign in Washington and will seek to minimize antiunion sentiment in state assemblies.

McDonald Mends Fences

Steelworker President David J. McDonald is starting to mend his fences. Although he won re-election early this year, he had the backing of only 65 per cent of the membership. In a speech before New York District steelworkers, he charged that "certain leaders" in industry, encouraged by the election returns, were "out to weaken the union." He urged members to close the rift in preparation for a possible steel strike in 1959.

Jobs Up, Except in Ten Cities

Unemployment increased substantially in these cities during April and May: Dayton, Hamilton and Middletown, O.; New Britain, Conn.; San Francisco and Oakland, Calif.; Flint and Grand Rapids, Mich.; Fall River, Mass.; Providence, R.I. Elsewhere, employment was at record peaks. The auto industry caused most of the area unemployment, says the Labor department, while construction and food processing industries showed good gains.

Steel Inventories Slip

Only 2 million tons of steel went into consumers' stockpiles in the first quarter of 1957, compared with 4 million tons in the same period last year, says Richard F. Sentner, executive vice president-commercial, U.S. Steel Corp. "A moderate liquidation of inventories will take place during the

Technical Outlook—p. 83 Market Outlook—p. 133

second half," he predicts. Total durable goods stocks, however, will probably rise moderately by autumn (see page 51).

In the Sea: Shipping Change

Only 21 per cent of our foreign trade in 1956 moved on U.S. ships, compared with 23 per cent in 1955, says Clarence G. Morse, maritime administrator. Ships under construction in U.S. yards will decline steadily, he says, unless we soon plan to replace our obsolete vessels. At the end of 1957, 31 ships will be under construction; 1958, 25 ships; 1959, 14 ships; 1960, 3 ships. U.S. yards expect to deliver 23 vessels in 1957; 34 in 1958. Congress failed to appropriate ship construction money for fiscal 1958, but Maritime's carry-over of $110 million will allow contracting for 20 ships.

On Land: New Freight Car Plans

Ideas for new financing methods are stirring among railroads and the freight car industry. The Delaware & Hudson Railroad has contracted with Bethlehem Steel Co. for 1000 hopper cars, 200 to be delivered annually for the next five years. Bethlehem will give the road a price discount after the first 200. And the Pennsylvania, New York Central and Baltimore & Ohio are considering formation of a separate financing organization to buy freight cars.

In the Air: Missile, Satellite Troubles

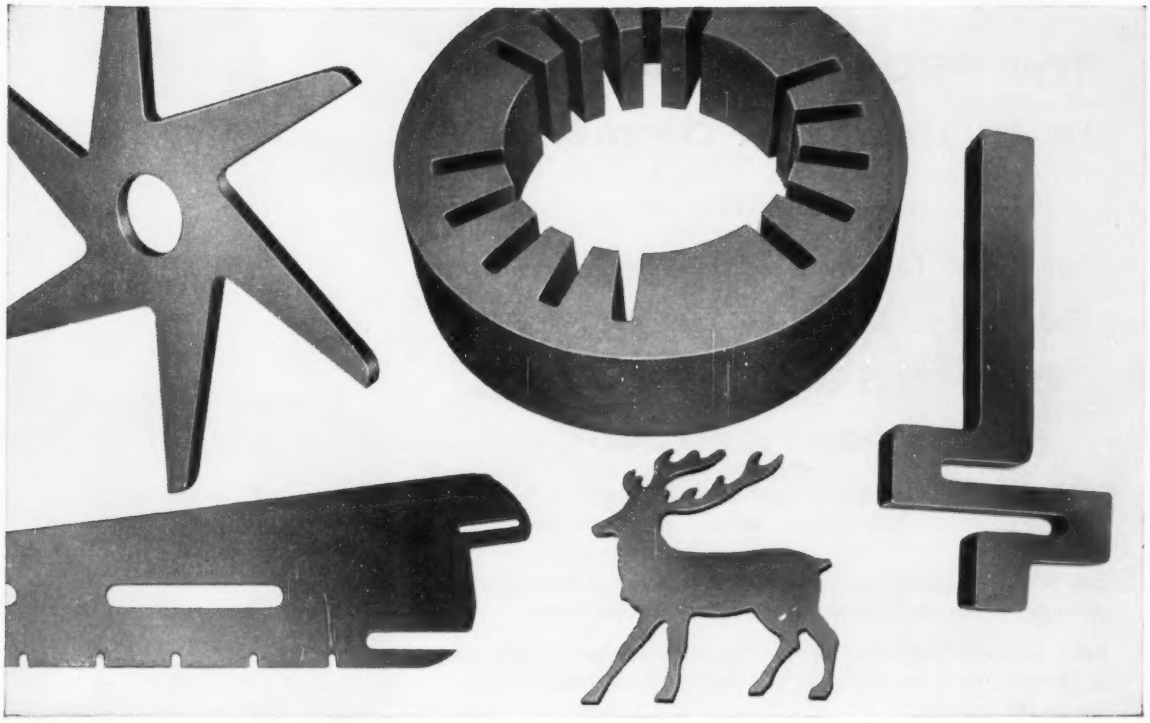
The Army wants industry to submit proposals for a tactical missile with a range of 750 miles, 550 beyond the limit imposed on the service by Defense Secretary Charles E. Wilson. The Army is going on the bird-in-the-hand theory, figuring that once it has specific ideas on the device, it can persuade the Pentagon to let it keep the unit . . . Prospects now are that the first launching of an instrumented earth satellite, originally scheduled for September, will be delayed up to a year.

The Steel Merger Case

Sometime this month, government lawyers will file a motion in New York District Court for a summary judgment barring the proposed merger of Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. Defense counsel will probably give their arguments by September and the court decision will come by about December. If the U.S. wins, the matter will be carried by the defense to the Supreme Court, a move which would involve at least another year before a decision. If the U.S. loses, it cannot go to the Supreme Court, but it can demand a trial, although its case would be weakened by the earlier loss. If the case goes to trial, the ultimate disposition probably wouldn't be known until mid or late 1959.

Straws in the Wind

Corhart Refractories Co., a Louisville subsidiary of Corning Glass Works, aims to boost its sales to the steel industry; 15 per cent of its product now goes there . . . Federal Reserve Board thinks the growth of installment credit will be slower in the future . . . Corporate profits, says the Commerce department, were as good in the first 1957 quarter as in the last 1956 period.



What's the lowest cost way to produce steel parts like these?

You may be paying considerably more than you need to for parts like these if you aren't taking advantage of Ryerson flame-cutting service.

Size makes no difference—nor intricacy of shape. You can order one part or one thousand and get quick delivery of steel cut to close tolerance—with almost die-cut accuracy from piece to piece. And here's where the saving comes in:

1. **No dies or molds** are needed so you save this cost when you switch from cast or forged parts to flame-cut parts.
2. **Less machining** is usually required to finish a flame-cut part. Sometimes machining is eliminated altogether.
3. **Freight costs lower**—If you're now paying freight on steel you later scrap you may well be able to pay for flame cutting with the money you save by shipping lighter flame-cut parts. The blank for a 6″ disc is 49% heavier than the disc itself. Storage and handling expenses are reduced, too.
4. **Less time in process**—You can often convert finished products into cash more quickly because parts can be produced faster by flame cutting.
5. **No loss on spoilage or rejects**—They're our problem—not yours.
6. **Design changes are simpler** and can be made more frequently without sacrificing manufacturing economy.

You draw on the nation's largest steel stocks at Ryerson—and unequalled flame-cutting facilities are ready to work for you. A blue print or sketch with clearly marked dimensions is all we need for prompt handling of your requirements. Call your nearby Ryerson plant for cost-cutting flame-cut steel today.

In stock: Carbon, alloy and stainless steel—bars, structurals, plates, sheets and strip, tubing, re-bars—industrial plastics, machinery & tools, etc.

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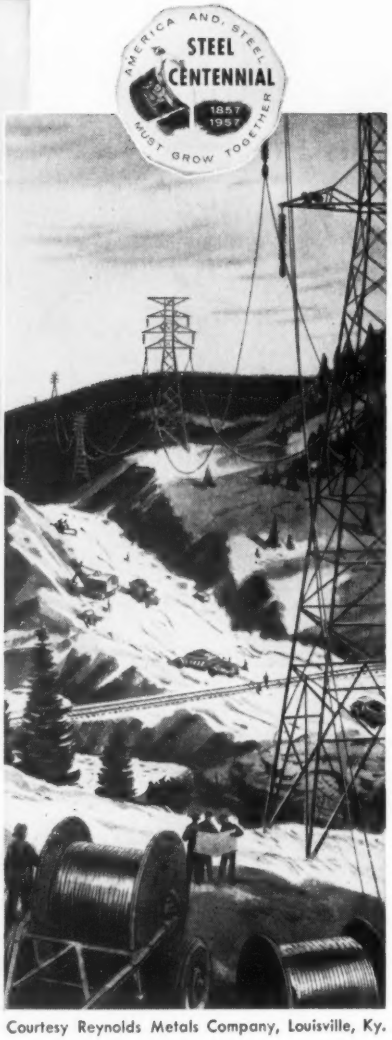
The PROOF of DSC STEEL is in its PERFORMANCE

for example

Here are Overall Job-Performance Scores of DSC ACSR* Core Wire

For 1956 . . . 99.784%

For 1955 . . . 99.740%



Courtesy Reynolds Metals Company, Louisville, Ky.

This information is of intimate interest to perhaps not more than a dozen or so users of ACSR wire in the whole USA and Canada.

But it may be of interest to steel users generally because the *STEELMANSHIP* that is responsible for this showing, is the same that goes into all DSC products.

***WHAT DSC ACSR WIRE IS**—It is a hard drawn, high carbon (range 0.50 to 0.75%), high tensile (175,000 psi to 190,000 psi minimum depending on gauge), heavy zinc-coated Specialty Wire produced at our Portsmouth Division. It is used to strengthen aluminum cable construction strung over long spans. It must meet extremely exacting acceptance tests for physical properties and dimensional accuracy, weight of coating and surface condition. Quality consistency is a "must"—for efficient stranding by the cable fabricator.

For the cable fabricator ACSR means Aluminum Conductors, Steel Reinforced.

For the wire producer, it means Aluminum Cable Strand Reinforcement.

WHAT THE RECORD MEANS—These job-performance records are significant in that they are based not on isolated case histories but on total ACSR wire shipments to all customers for two consecutive years. The customers are among the top-ranking aluminum cable manufacturers. These shipments amounted to millions of pounds. The percentages show that out of every 100,000 pounds shipped, 99,784 pounds met all acceptance tests during 1956; 99,740 pounds, the year before.

You may never have occasion to buy a pound of ACSR wire. On the other hand, we would appreciate the chance to prove to you that other DSC wire products, including wire rods, as well as DSC sheet and strip, offer you the same kind of on-the-job performance.

Call us . . . soon?

Customer Satisfaction Is Our Business

DSC MILLS AND PRODUCTS

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Hot Rolled and Cold Rolled Sheets • Low and Medium Carbon
Manufacturers' Wire • High Carbon Specialty Wire • Aluminum Cable Steel Reinforcement • Rope Wire • Tire Bead Wire • Welded Wire Fabric

MILL DIVISION: DETROIT, MICH., HAMDEN, CONN.

Cold Rolled Carbon Steel Strip
Flat Cold Rolled Carbon Spring Steel

DETROIT DSC STEEL

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GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

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The Steel Age

This year marks the centennial of steel and the Steel Age. History already has honored the inventors of the processes that have made the mass production of steel possible, but on an occasion such as this, we think a special tribute is in order because these men are responsible for a great deal of the industrial prosperity and gracious living we enjoy today.

At the risk of omission, we would single out these pioneers of the Steel Age:

One hundred years ago, Sir Henry Bessemer and William Kelly were granted patents for the making of steel by blowing air through hot iron in an egg-shaped vessel. Sir Henry also was granted a patent for the rolling of plates from molten metal poured between water-cooled rolls.

The Appolt brothers (in France) made the first coke from bituminous coal in a closed retort.

John Fritz invented the 3-high rolling mill.

Ichabod Washburn developed a continuous process for hardening and tempering wire.

As we honor those men, we should not overlook these early key developments:

The first oil well at Titusville, Pa. (1859); the continuous rod mill (1869); the Wellman open-hearth charging machine (1888); the internal combustion engine operating on blast furnace gas (1890); and the rotary piercing method for making seamless tubing (1895).

Although each contribution is important, the bessemer converter stands out. It was responsible for the transition of industry from the Iron Age to the Steel Age. But we must not overplay even its role in an industry that doesn't stand still.

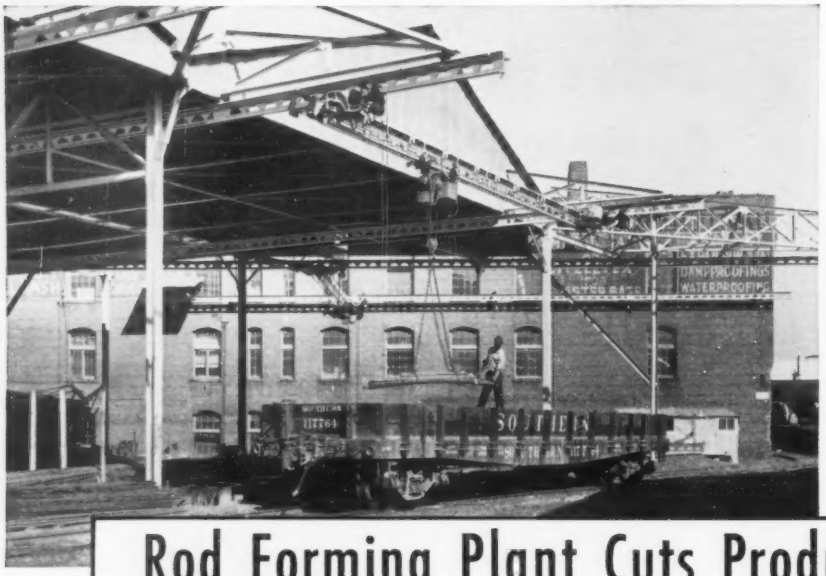
By 1906, when steel production reached a peak of 26 million tons, the more readily controllable open hearth was making progress. In the same year, the electric arc furnace appeared as a new factor in steelmaking. By 1908, open hearth production topped the output of bessemers for the first time.

As we enter the second century of the Steel Age, the parade of progress continues. Vacuum furnaces are moving in as an accepted means of making steels with exceptional physical properties. The bessemer converter (using oxygen) is enjoying a rebirth. Continuous casting is close at hand. So are many other new and improved ways of making more and better steels.

Those new methods demonstrate that the enterprise and ingenuity of steelmen will contribute to progress in the future as in the past.

Irwin H. Such

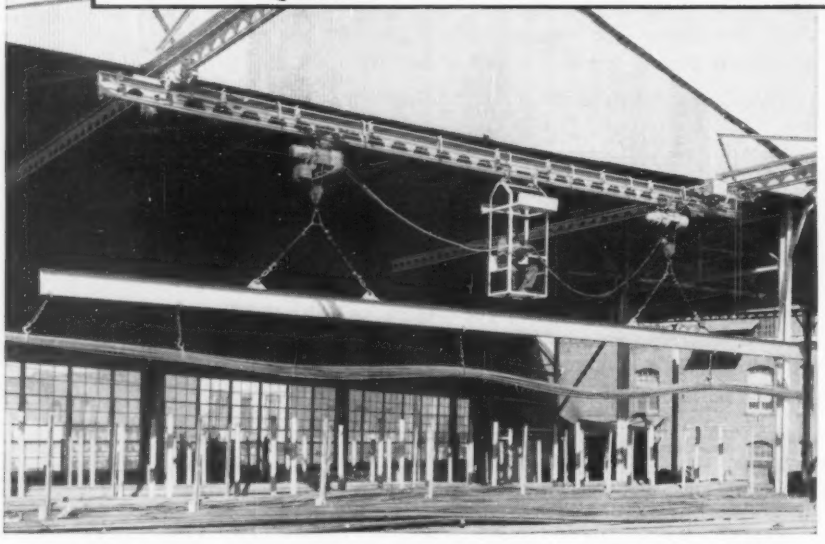
EDITOR-IN-CHIEF



Unloading bundles of rod with a Cleveland Tramrail transfer crane arranged for push-button floor control. This crane may be interlocked with the track system serving various sections of the shop, enabling the load being delivered directly to point of use with the Tramrail hoist carrier without need of any in-between handling.

Rod Forming Plant Cuts Production Time 50%

Reduces Costs Tremendously with Cleveland Tramrail System



Here the same crane is shown with an operator's cab and second hoist carrier. The hoists support a lifting beam which will handle bundles of rod up to 60'-0" long. Note the runway extensions that permit spotting the crane directly over a gondola car.

"THERE is no comparison between a shop equipped with Cleveland Tramrail handling equipment and one using hand methods," said an executive of the Southern GF Co., Atlanta, Georgia.

He should know, because this prominent company has cut production costs in half in the cutting and forming of steel rod for concrete work. Savings are made with the tramrail starting with unloading of incoming steel and through the various steps of manufacture. For instance, only 10 man-hours are now required to unload a railroad car as compared to 45 formerly required.

The Cleveland Tramrail at Southern GF has been designed to provide the utmost in flexibility of handling. It consists of transfer cranes and a track and switch system. The crane used for car unloading can be arranged for floor control or cab control. The latter arrangement is used when 60-foot long bundles of rod are handled by two widely spaced hoists, the cab being located at the center of the bridge.

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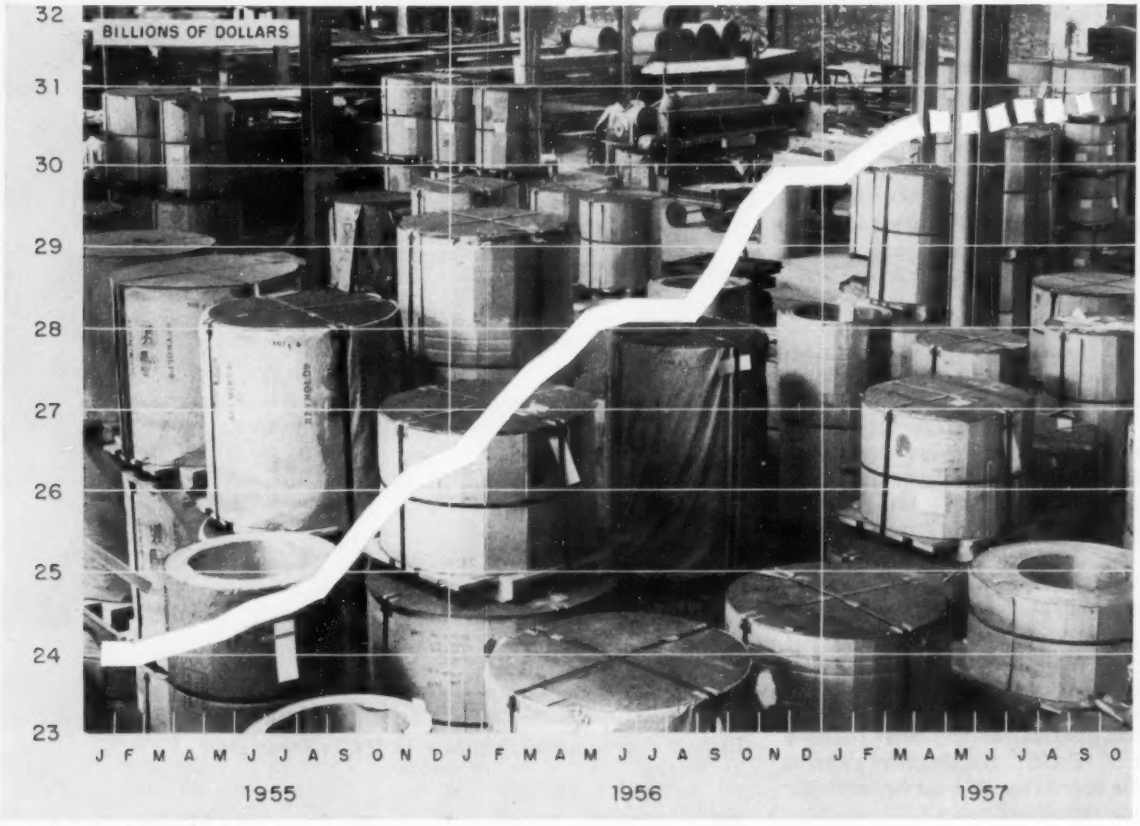
Manufacturers' Durable Goods Inventories Rise

(Figures are seasonally adjusted)



Source: Commerce department.
Apr.-Sept. 1957, estimated by STEEL.

PAs See Business Increase

Rising production capacities are a major reason for the plateau in inventory levels, buyers told. Upturn should come in second half as high consumer and U.S. spending continue

A STRENGTHENING in inventories of durable goods—particularly raw materials—may be near if the business expectations of the men who buy are indicative.

Many purchasing agents already see an improvement in their companies' business levels. Many other buyers are optimistic.

Pickup—Delegates at the annual convention of the National Association of Purchasing Agents last week in Atlantic City heard reassurances from several quarters that business will be good. The NAPA Business Survey Committee, for example, reported that 52 per cent of the committee members now expect business for the rest of the year to be better than it has been thus far.

Measured by the gross national product, business was at a record high in the first quarter ($427 billion annual rate) and appears to be going even higher in the second quarter, said Martin R. Gainsbrugh, chief economist and director, Division of Business Economics, National Industrial Conference Board.

Offset—The opening half of 1957, Mr. Gainsbrugh explained, has seen enough strength in end product demand to more than offset the loss of demand for inventory purposes. As a result, employment and personal income were unaffected.

Assurances of good business came also from the purchasing agents' outgoing president, H. Stafford Kellam, who is buyer for General Electric Co.'s Circuit Protec-

tive Devices Department, Plainville, Conn.

Economy High—He said: "Although some of the steam is out of the boom in capital spending, there is still a lot of underlying strength in consumer spending and government purchases, particularly public construction and national defense, which keep the economy on a high prosperous level.

"The output of durable goods has declined slightly, due to a lower demand in consumer durables. As the year progresses, I expect that consumer durables production will shift into a rising trend as manufacturers' inventories are worked off and consumers get into a buying mood again."

He predicted: "Nondurable goods will experience the same thing. Producers' goods production will go down, I think, but not drastically."

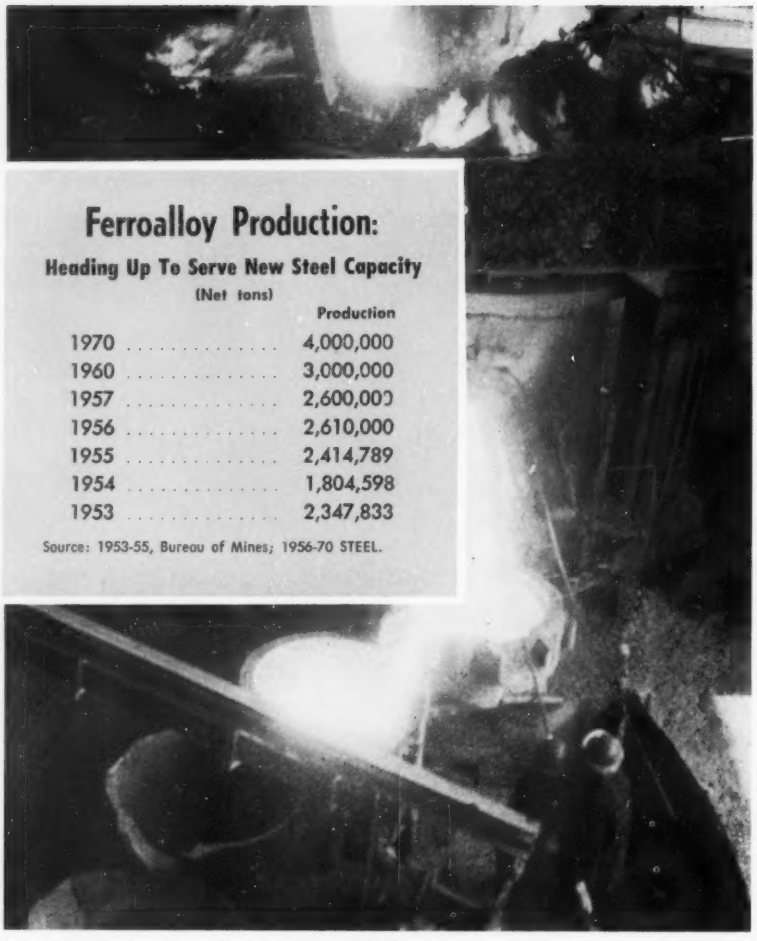
Reason—Mr. Gainsbrugh put his finger on a chief reason why buying for inventory eased off: Expanded production capacities. We, he pointed out, are entering a period where one of our basic economic problems is that of bringing total market demand up to a greatly enlarged capacity.

Even though industrial capacities have been expanded, expenditures for new plant and equipment will continue strong in the second half of 1957, Mr. Gainsbrugh said. He based this on a survey made by his organization.

Teamwork — Purchasing agents, said Mr. Kellam, need a team of suppliers that can provide a sound product, reliable delivery dates and fair prices. "But, additionally, we want more technical information and service and more product information by competent, well-informed sales engineers."

Mr. Kellam elaborated on "fair prices" this way: "Above all, in our negotiation with suppliers we must be sure that they stand to make a fair profit which will keep them free and independent agents, but at the same time offer a quality product that gives us a definite and distinct advantage for our company."

He is being succeeded as NAPA president by Robert E. Shillady, general purchasing agent of New England Electric System Companies, Boston. Next year's convention will be in Chicago.



Ferroalloy Production:

Heading Up To Serve New Steel Capacity

(Net tons)

	Production
1970	4,000,000
1960	3,000,000
1957	2,600,000
1956	2,610,000
1955	2,414,789
1954	1,804,598
1953	2,347,833

Source: 1953-55, Bureau of Mines; 1956-70 STEEL.

Tapping electric ferroalloy furnace at TP&C's Roane plant

Expansion in Ferroalloys

TENNESSEE Products & Chemical Corp., a Merritt-Chapman & Scott Corp. subsidiary, christened its Roane (Rockwood, Tenn.) electric furnace plant on May 22.

The facility will make ferroalloys—enough of them, says a TP&C spokesman, "to make us the second largest ferroalloy producer in the world." The company has been making ferromanganese in a small blast furnace at Rockwood and other ferroalloys in two electric furnace plants in Chattanooga, Tenn. By midsummer when the new plant is completed, TP&C will begin moving its ferroalloy operations out of Chattanooga, concentrating in Rockwood.

From there, and from its Tenn-Tex Alloy & Chemical Corp. plant in Houston, the company will serve a marketing area extending from the East Coast to the Rockies.

Volume—Production of the $15-million plant will be around 200,000 tons a year, about two-thirds as much as the total increase in ferroalloy output over the last four years. A lot of this is increased tonnage for the company.

The chart above shows how industry will absorb it. By 1970, demand for ferroalloys should double. Reasons: Greatly enlarged steel capacity; increased demand for alloy and stainless steels; growing foundry needs; expanded use in nonferrous metals; new uses (for example, silicon metal in the chemical industry).

Heartland—Without TVA power,

a village halfway between Chattanooga and Knoxville would seem to be an unlikely place for this type industry. The plant will draw a continuous load of 122,000 kw from the Kingston, Tenn., steam plant and Watts Bar Dam.

Water transporation is the second compelling reason. The plant is 4 miles from the Tennessee river, where it has docking facilities. The company has river terminals at Chattanooga, Pittsburgh, Chicago and Houston. Within a few years the Cumberland river will be navigable to Nashville, the Alabama river from the gulf to Rome, Ga., and the Tombigbee river to the Tennessee. This will give Tennessee Valley industry a short haul to the gulf at Mobile, by-passing the Mississippi.

Products—Tennessee Products produces ferrochrome, ferrosilicon, ferromanganese and ferrochrome silicon in high and low carbon grades. It intends to make others.

The new plant is divided into two units: Plant No. 1 houses eight submerged arc furnaces (five are presently operating; three are under construction). Plant No. 2 houses two open arc tilting furnaces and a large rotary kiln for drying furnace charge materials.

The company's blast furnaces (two, 300 ton per day furnaces at Rockwood; one, 100 ton per day furnace at Lyles, Tenn.) melt standard and specialty grades of foundry irons, with one of the Rockwood furnaces alternating on ferromanganese. Much of the pig iron and considerable quantities of ferroalloys are consumed locally. Chattanooga alone has 22 foundries.

Steel Stockholders Set Record

More people are receiving steel industry dividend checks than ever before, says American Iron & Steel Institute. At the end of last year, 885,861 people held stock in the 52 companies which produce 94 per cent of the country's raw steel. Average employment of these firms in 1956 was 824,894.

During 1955 and 1956, shareholders increased 15 per cent (117,000), employees increased 8 per cent (63,000) and ingot capacity gained 14 per cent.

Electronics Sales and Production Expand

	1957*	1956*
Manufacturers' sales**	$5.7 billion	$5.5 billion
TV sets produced	6 million	7.3 million
Total radios produced	15.3 million	14.1 million
Portable radios produced	3.7 million	2.6 million
Phonographs produced	5 million	3.3 million

*Fiscal year ending June 30.

**Including all parts and components for industry and the armed forces, as well as entertainment devices.

Electronics Has Best Year

GE's Baker tells RETMA convention that fiscal 1957 factory sales, service, distribution and broadcast revenues will come close to $12 billion; outlook is bright

A CHANGED and expanding electronics industry with "the ceiling not in sight" is hailed by Dr. W. R. G. Baker, president, Radio-Electronics-Television Manufacturers Association.

Speaking at the 33rd annual RETMA convention in Chicago, Dr. Baker, vice president and general manager, General Electric Co., credited $15 billion spent on electronics by the Defense department since 1950 with changing "the face of our industry materially."

Peaceful Pursuits — "That is more than twice the amount spent by the government during the whole of World War II," he said, "yet, except for the minor uses of these developments in the Korean War, there has been relatively no consumption of this production in actual warfare.

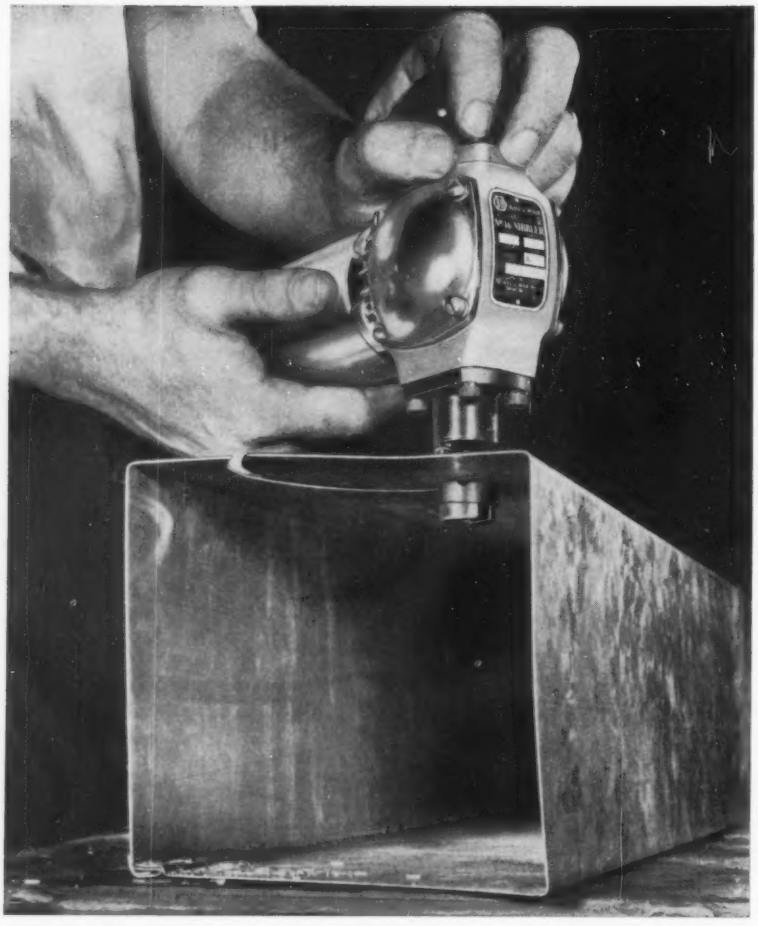
"Our industry is currently producing electronic equipment and parts at a rate higher than ever before," he continued. This output is divided about equally between military and commercial business, with the edge slightly in favor of the military."

Automation — Dr. Baker said that the increasing industrial use of electronic devices in computing equipment and automation promises to swing the balance the other way.

"The output of our factories represents about half the total annual dollar volume of the electronics industry," he continued. "When broadcasting revenues, merchandising distribution costs and servicing are added to the nearly $6 billion in factory sales, the total comes close to $12 billion."

Growth — Predicting continued growth and change for the industry's future, Dr. Baker cited the strength of radios and record players in today's market.

"Receivers and phonographs are showing remarkable vitality, despite their age," he said. "Radio, whose demise was prophesied when television made its debut, is making a comeback, thanks largely to technical improvements."



Black & Decker's nibbler for continuous cutting of thin sheet metal is typical of small power tools used by do-it-yourselfers

Power Tool Sales Climb

SALES of portable electric tools continue to rise under the impetus of a home-use market that still shows no sign of peaking. For some manufacturers, the home market is bigger than the industrial.

Steady Growth—Sales this year are expected to hit between $180 million and $200 million, compared with $150 million to $170 million in 1956. Figures include parts and accessories. Sales increases over the last several years have ranged between 4 and 7 per cent annually. Gains of some manufacturers are as high as 18 per cent over year-ago performances.

About 60 companies make electric tools, but 60 per cent of the sales volume is accounted for by about 15 major manufacturers.

Spiral — Since World War II, sales have tripled. The pattern has been an upward spiral, with a leveling off in the last two or three years. It was not until 1948 that any major manufacturer began to make and sell a low-priced line of portable tools for the do-it-yourselfer.

Electric power tool users fall into two main groups: The professional and the amateur. The pros include workers in industrial plants who use the tools in production or maintenance, operators of automotive service shops and tradesmen in such lines as building, plumbing, electrical and maintenance. Amateurs include home workshop owners, hobbyists, do-it-yourselfers and farmers.

Drills Lead—Before World War II, portable electric tools were all of heavy-duty design for industrial and automotive service users. Then, as now, drills predominated. The power saw is coming up rapidly now, but it faces the competition of the extremely popular stationary bench saw.

During the last five years, many tools long used by industry have been developed for the home market. (Included are routers, planers, grinders, sanders, impact wrenches, screw drivers, jigsaws, saber saws and chain saws.)

Twice as Fast—While the industrial market has been growing around 5 per cent annually, the home market has been expanding at twice the pace.

Home market power tools are built lighter than their comparable industrial models. The major difference is life expectancy. Home market tools are built for intermittent use. Their industrial counterparts are for production service.

Costs More—An industrial tool may command twice the price of its home version. Because of rising material and labor costs, manufacturers have been hiking the price of industrial models about 5 per cent annually for three or four years, but competition for the home market has been a restraining influence. In fact, home tools like drills and saws are a lot cheaper than they were several years ago.

Since the market is competitive, price cutting is fairly widespread, but it is more pronounced in the do-it-yourself phase than it is in the industrial and automotive tool fields. Another factor: Power tools are closely allied to the small appliance industry and subject to the same price influences.

Welding Equipment Makers Gain

Members of the Resistance Welder Manufacturers' Association more than doubled their capital investments in ten years. RWMA fig-

ures show that the invested capital of 18 member companies increased from $6.5 million on Dec. 31, 1946, to $14 million on Dec. 31, 1956.

In this period, manufacturing space grew from 528,000 to 812,000 sq ft. Employees increased from 2000 to nearly 3000.

Comparison of 1956 figures with those of the previous year showed gains of 39 per cent in shipments and 21 per cent in new business.

Develops New 'Glass'

Corning's ceramic material is lighter than aluminum, resists heat to 1300°F

WHAT may prove a strong competitor for metal as a basic engineering material has been developed by Corning Glass Works, Corning, N.Y. Called Pyroceram, it is a nonporous crystalline substance made from glass.

Said to be harder than high carbon steel, lighter than aluminum and up to nine times stronger than plate glass, it will retain its strength at temperatures up to 1300°F, says Dr. W. H. Armistead, vice president and director of research and development. Its softening point, 2460°F, is above the melting point of some stainless steels.

Applications — Confident of its electrical insulating properties and resistance to acid corrosion, Corning officials expect Pyroceram to be used for missile radomes, combustion-type electric turbines, jet engines for supersonic aircraft, architectural purposes (curtain and load-bearing walls, simulated marble), oil refining, chemical processing, range tops and home cookware.

"Unlike most high-strength, high-temperature crystalline materials," says Dr. Armistead, "Pyroceram has great flexibility in forming. It is adaptable to mass production and can be pressed, drawn, blown, rolled and centrifugally cast."

Invented by Dr. S. D. Stookey, manager of fundamental chemical research, the material will be in commercial production by July. It will probably cost more than glass but less than stainless.

A-Plane in Design Stage

Nuclear powered aircraft now a certainty, says head of Lockheed project. They will operate throughout the world from U.S. base, cutting cost of foreign fields

ELIMINATION of the costs of foreign air bases and air-to-air fueling will be two immediate benefits of a nuclear powered plane.

Two such aircraft are in the preliminary design stage. Firms involved: Convair Division of General Dynamics Corp. (airframe); General Electric Co. (engine); Lockheed Aircraft Corp. (airframe); and Penn-Texas Corp.'s Pratt & Whitney Co. (engine). Lockheed's project director, F.A. Cleveland, says: "The plane will be based in the U.S. and still have a striking power against any place in the world."

A Clue?—Recent cutbacks in the Air Force's K-135 tanker program (STEEL, Apr. 29, p. 128) have led some observers to believe we are closer to the A-plane than the Pentagon indicates. Target date had been set for early 1960s.

Features—The fire hazards of flying will be reduced with the A-plane. "If chemical fuel is used only for take-off and landing, the entire system near the engines could be purged and rendered inert during nearly all of the mission," says Mr. Cleveland.

Thick shielding will be used to protect the crew from radiation, and that will also protect the plane "almost completely" from fragments and small projectiles. The plane will be vulnerable to large explosives.

The crew compartment will be large enough for comfort but relatively small to hold down shielding weight. Divided shields may be used: One around the crew in the nose, another around the reactor near the tail.

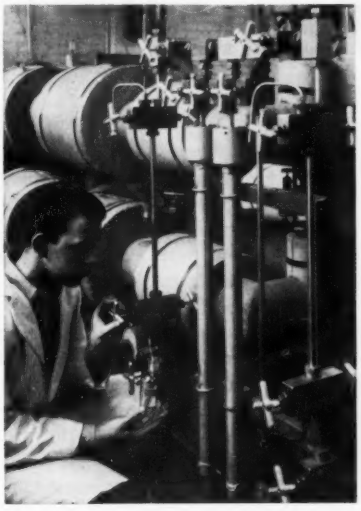
Details—The power plant will be inside the fuselage instead of on the wings to reduce heat transfer problems from the reactor to the power plant.

The wings will be thinner than conventional ones since engines, landing gear and fuel will be eliminated from them. The tail will be smaller in volume.

The plane will have few windows, and its stronger than usual landing gear will be attached to the fuselage.

Difficulties — Radioactivity will make maintenance difficult on the ground since maintenance crews won't be shielded. Radioactivity may interfere with radio transmission and radar ranges.

Mr. Cleveland is confident such a plane can get into the air: "Many problems which seemed insurmountable two years ago have proved to be minor or nonexistent," he says. Unexpected problems have arisen, but he concludes that every year makes the feasibility of a nuclear powered plane more of a certainty.

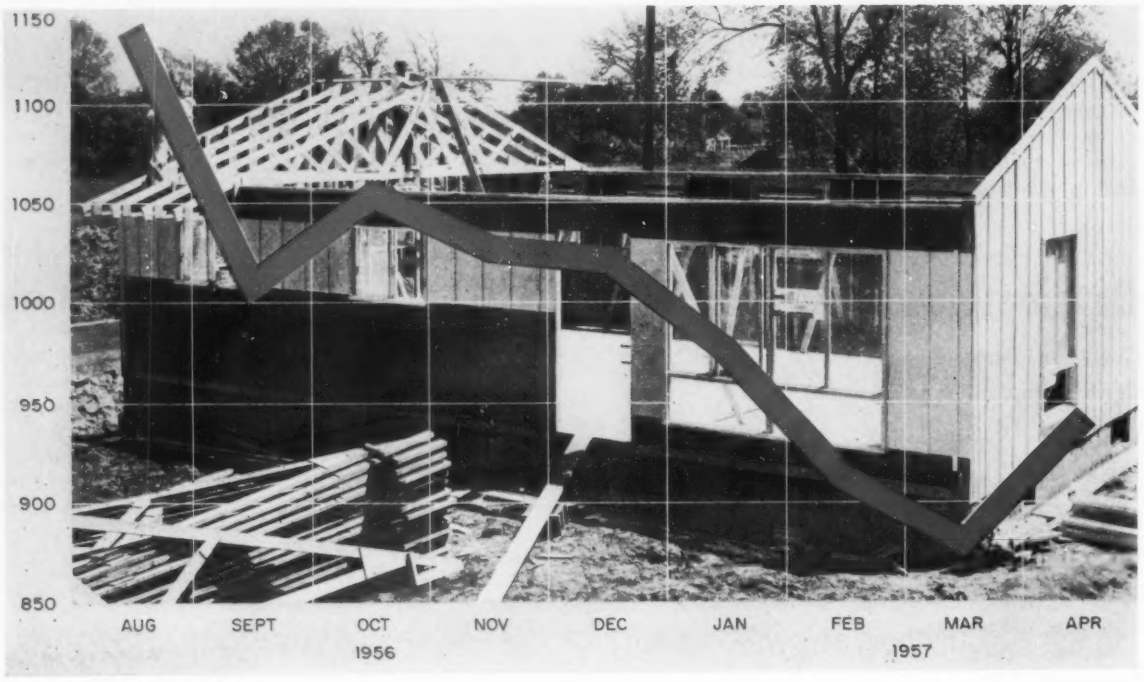


Tests Atomic Materials

Westinghouse Electric Corp.'s "test loop" checks atomic material for corrosion resistance: The system employs stainless steel pipes which carry hot, pressurized fluid under controlled conditions against 10 specimens of test materials. Corrosive additives vary the fluid

Housing Begins Uphill Climb

Thousands of starts, seasonally adjusted annual rate



Source: Bureau of Labor Statistics.

Housing Falls Behind Need

CONTROVERSY is commonplace in reports on the housing situation. Most of the ruckus centers on the level of housing starts and changes in the interest rates.

Two facts stand out: 1. Housing starts will be lower this year than any time since 1949 and may drop below 1 million. 2. Tight money (blamed by many for the housing decline) is now not quite so tight.

Housing Starts — Government predictions for this year range from about 1 million new homes (if help from Congress reaches the builders in time, and credit becomes easier) to 900,000 units.

Builders consider the present slump to be in its second year. Nonfarm housing starts hit a peak of 1.3 million units in 1955, then fell to 1.1 million last year.

F. W. Dodge Corp., New York, comments: "Any year in which this nation builds as few new housing units as we did last year might well be considered a year of underbuilding."

Kenneth S. Keyes, president, National Association of Real Estate Boards, Chicago, says there is a basic demand for 1.2 million new homes this year.

But—Norman Strunk, vice president, U.S. Savings & Loan League, Chicago, takes a different view. He attributes the homebuilding decline to a drop in demand and the end of easy credit terms. He says new family formations have declined by about 45 per cent in the last eight years and maintains that the postwar housing shortage is largely met.

Dodge uses Census Bureau figures to back up its contention that the basic demand for housing is strong—"perhaps stronger than ever." The figures show that available vacancies in last year's fourth quarter were only 2.5 per cent of the housing supply. In the third quarter of 1956, the vacancy rate was 2.8 per cent. Vacant units dropped an estimated 150,000 in three months. Dodge points out that a vacancy rate of 5 per cent is considered normal.

George S. Goodyear, president, National Association of Home Builders, Washington, raps the Federal Reserve Board's tight money policy. He contends: "With every day that passes, our housing inventory is depleted by another 1200 new homes, which are needed now and for the future but which are not being built."

Trouble Ahead?—Mr. Goodyear continues: "If home building is not regenerated now, the 1960s will see the worst housing shortage in all our history."

Government sources, while crediting the housing industry with much more flexibility than it will claim for itself, also foresee an

increasing demand for housing.

One Commerce department official says: "We are going to get a bulge in family formations early in the 1960s and especially in 1966-67."

Interest Rates — More controversy is generated by interest rates than any other factor in the housing situation. Take these examples:

1. Mr. Goodyear: "I must say bluntly that we in the home building industry question the wisdom of a monetary policy that restricts nothing but the housing needs of the American people, that encourages Caribbean pleasure cruises on credit but denies a workingman the opportunity to decent housing for his family on terms he can afford to meet."

2. Mr. Strunk believes that easy terms for mortgages are not possible with other money rates as they are unless the federal government subsidizes borrowers.

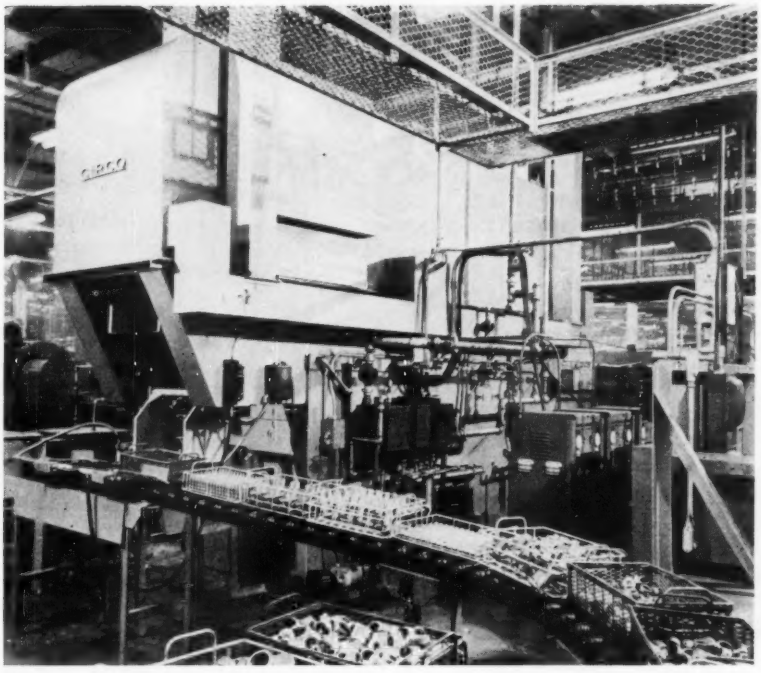
Bright Side—Mortgage money is becoming slightly easier. In Detroit, FHA applications have increased 42 per cent over the first two months of the year.

The discount rate in Detroit has dropped from an average of 6.2 to about 4.3 per cent. A few GI mortgages are being negotiated.

The housing bill will also perk up housing starts, probably in the fall. The Federal National Mortgage Association (it buys mortgages in the secondary market) will probably get an additional $100 million or $175 million from Congress.

Dollar volume of housing will be down less than the number of starts. Part of this is due to higher building costs, but part represents a continued upgrading in the size and quality of new housing.

The experience of the plumbing industry shows it is possible for metalworking industries to keep from feeling the full brunt of the housing slump. The Plumbing Fixture Manufacturers Association, Washington, points out that fixture sales dropped only 5 per cent (dollar volume) last year while new home starts dropped 15.8 per cent. Reasons: 1. New homes have more bathrooms. 2. Spending for home modernization has increased.



Ultrasonic degreaser at Saginaw Steering Gear, Saginaw, Mich.

Big Ultrasonic Uses Coming

ULTRASONIC cleaning equipment has a market potential approaching $2 billion, says R. L. Rod, president of Acoustica Industries Inc., Glenwood Landing, N. Y.

Addressing a New York meeting of the Acoustical Society of America, Mr. Rod declared that 500 firms have spent $3 million for such equipment to date. The market includes 282,000 other American manufacturers who must clean either their products or their production machinery. Sales have been limited because installations have required custom building.

More Prospects—Mr. Rod emphasized that the figures cited above do not include a market for surgical instrument cleaners in some 7000 hospitals; a possible demand for ultrasonic dishwashers in 100,000 restaurants, 1000 hotels and 40 million homes; and a market for ultrasonic watch cleaners among 50,000 watch repairmen.

Current Uses—Commenting on the growth of the industry since its birth 15 years ago, Mr. Rod enumerated applications for ultrasonic equipment. It is now used to gain information in nondestructive testing, liquid level sensors, delay lines, filters and viscosimeters. It's useful in metal drilling, grinding and cleaning, oil well drilling, degassing, emulsification, barnacle and boiler scale inhibition, heat transfer improvement, soldering and welding.

While members of the Ultrasonic Manufacturers Association estimate their sales between $15 million and $25 million annually, non-UMA sources put the industry's production at about $200 million a year. All seem to agree on prospects for a tenfold increase in the next decade.

New Uses—Future applications will include flowmetering, plating, flotation, impregnation, particle precipitation, pickling, quenching and etching, Mr. Rod predicted.

Congress, Defense Tug at GSA

LOOK for a congressional move to revamp the laws under which the General Services Administration builds up stockpiles of strategic materials. They include: The Defense Production Act, Strategic & Critical Materials Stockpiling Act, Agricultural Trade Development & Assistance Act, Domestic Minerals Program Extension Act and the Domestic Tungsten, Asbestos, Fluorspar & Columbium-Tantalum Production & Purchase Act.

Faced with the problem of administering such legislation, Franklin G. Floete, GSA head, is calling for a consolidation of the laws.

Sympathetic—Sen. A. Willis Robertson (Dem., Va.), chairman of the Joint Committee on Defense Production, appears more than sympathetic on that score. He hints that consolidation might bring some major changes in the GSA stockpiling program, which is administered under the Office of Defense Mobilization.

In the past, GSA has found itself badgered by congressional desires on one hand, Defense department needs on the other. All the mining state legislatures have a solid interest in GSA; so do members of the economy bloc as the estimated net loss of the GSA rises toward the $1-billion mark—as of Dec. 31, 1956, it was $852 million. The GSA loses money through administration expenses, shifting market prices for the material it inventories under defense needs and outright purchase of minerals to keep our domestic industries going.

Mining Interests—The status of the tungsten purchasing program is indicative of GSA's situation. Mining state senators have again pushed through $30 million for the metal; the House seems determined to fight the Senate down to the last breath.

There will probably be a compromise, which will leave GSA holding the bag, in the sense that it has to mark down whatever losses occur through the program.

Hearings—Personnel from GSA, ODM, Interior, Commerce and Agriculture departments are now stating their cases to Senator Robertson's committee. Items gleaned from the testimony:

Nicaro—The government's nickel facility at Nicaro, Cuba, is under contract until July 15, 1957, but negotiations have been completed to get a "breathing period" by extending the agreement to Dec. 31. "A final decision has not been reached as to whether the Nicaro operation will be continued thereafter under a government contract or by private industry," concludes Mr. Floete.

Aluminum—It has cost GSA $106 million to take the aluminum "put" by firms which expanded under Defense Production Act guarantees.

Titanium—The GSA has been trying to sell 9300 tons of titanium held in its DPA stockpile, but can't get the price it wants.

Specifications—Of $605 million worth of strategic metals held in DPA stockpiles, $225 million does not meet specifications set up by Defense department. Some of the low grade stuff is there because GSA has to take it under DPA guarantees; other minerals have deteriorated while held.

New Mineral Program Ready

Interior Secretary Fred A. Seaton says the long awaited mineral program has been approved by the President. Its essentials: 1. Stabilize the lead and zinc industries through new import excise taxes. 2. Increase production of domestic beryl, chromite and columbium-tantalum. The program will cost around $6 million and will include production bonuses.

The State department reportedly will fight the increased taxes on lead and zinc imports to protect producers in Canada, Mexico, Peru and Australia.

Titanium Requirements Drop

The Business & Defense Services Administration says titanium requirements for military aircraft, guided missiles and components will be stretched out through 1959. Military applications now take 98 per cent of all domestic mill production.

Some members of BDSA's Titanium Industry Advisory Committee say orders have already decreased "sharply" in the last two months.

Food for Financial Thought

The Joint Economic Committee has summarized the outlook for 1957 in preparation for congressional hearings. Highlights: 1. Gross national product will hit $435 billion this year. 2. GNP's rise since the last quarter of 1956 has been almost all in terms of rising prices rather than increased production. 3. The inventory situation is described as one of "mild liquidation." 4. The housing industry may be near the end of its decline which began in 1955. 5. Prices of finished goods will continue to rise, while those of raw and intermediate goods may have leveled off. From the first quarter of 1952 to the first quarter of 1957, government purchases, as a percentage of the gross national product, have dropped from 21.3 to 19.9 per cent.

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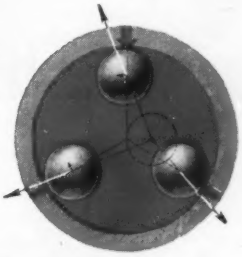
Diameters and adjacent radii and shoulders are precision ground in one operation on this CINCINNATI FILMATIC 10"R x 18" Angular Wheel Slide Grinder. Sizes available: 6"R and 10"L x 18" or 30" between centers; 10"R and 14"L x 18" to 72" between centers.



Automatic grinding wheel balancing, an exclusive CINCINNATI feature, balances the wheel and mount within a few seconds.

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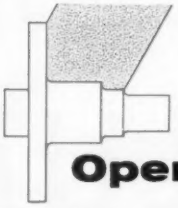

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Push-button automatic grinding cycle, incorporating coarse and fine feed rates.

Roll-out cutting fluid tank. Cuts down service attention.

***Automatic air-electric gage sizing** with cycle time stabilizer. High degree of accuracy and compensation for wheel wear obtained automatically.

***Automatic gap eliminator.** A timesaver where stock allowance varies widely.

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Additional features and their advantages are illustrated and described in catalog No. G-686. Write for a copy. Brief specifications in Sweet's.

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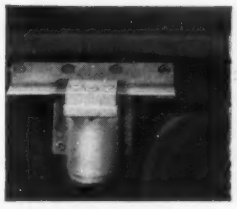
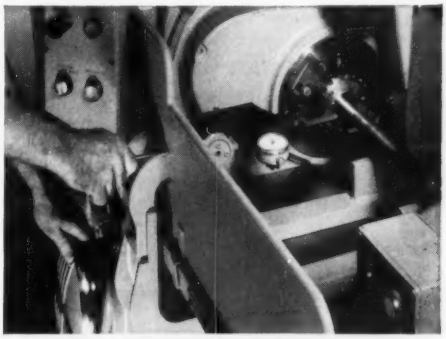
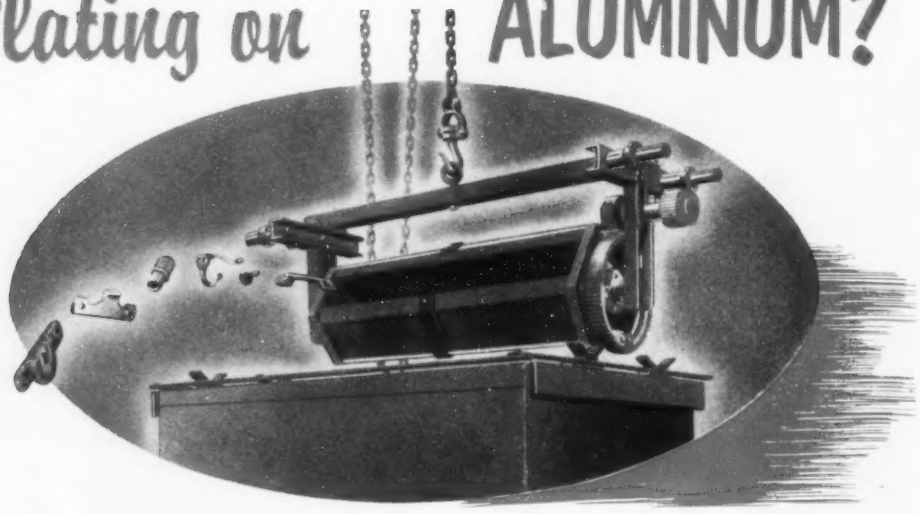


Automatic hydraulic table clamp automatically locks the machine table in position during the grinding cycle.



Manual flagging device, for locating the work axially with respect to the wheels, is simple and accurate. Automatic flagging device is also available.

Plating on ALUMINUM?



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Automatic transfer machines finish and handle crankcases at Billancourt plant

Renault Likes Automation

French automobile manufacturer increases its production, reduces labor costs and manufacturing time with a fully automated machine shop at its Billancourt plant

AUTOMATION is well established in the plants of Regie Nationale des Usines Renault, the nationalized French automobile firm.

Renault employs 53,000 people, (including sales force), produces 1300 units per day, accounts for 33 per cent of French auto production and 42 per cent of vehicle exports.

By Degrees—Partially automatic processes were used long before Ford Vice President Del S. Harder coined the word "automation," says a Renault spokesman.

Renault's first real automation came about in 1947 when transfer machines were installed. The next step was taken in 1956 with the production of the new Dauphine model.

Continuous—Three special machines handle the milling of the two contact surfaces for crankcases. Sixteen transfer machines handle 240 operations. Average hourly production: 60 units.

In this fully automated shop at Billancourt, near Paris, production workers dropped from 120 to 20. Conversely, 18 full time electricians and maintenance mechanics have replaced six part time workers. Total employment is climbing.

Long View—Renault built 46,000 vehicles in 1939 with 23,000 production workers. In 1955, the firm produced 222,000 vehicles with 46,000 production workers. In 1905, a crude French car cost (in today's coin) more than $11,000. The modern, mass-produced Renault sells (in France) for about $1500.

"Any reduction in manufacturing time lowers production costs and widens the market," says a Renault spokesman. "As long as sales increases are greater proportionately than this time reduction, new labor will always be needed. In 1900, several thousand were employed by the French automobile industry; today, approximately 1.2 million earn their living from it in one way or another."

U. S. Awards Swiss Contract

The Pacific Oerlikon Co., Tacoma, Wash., U.S. representative of Oerlikon Mfg. Co., Zurich, Switzerland, has been awarded the contract for a generator for the Department of Interior reclamation power plant at Green Springs, Oreg. The bid was $283,668, the Bureau of Reclamation announced.

Urges Foreign Investments

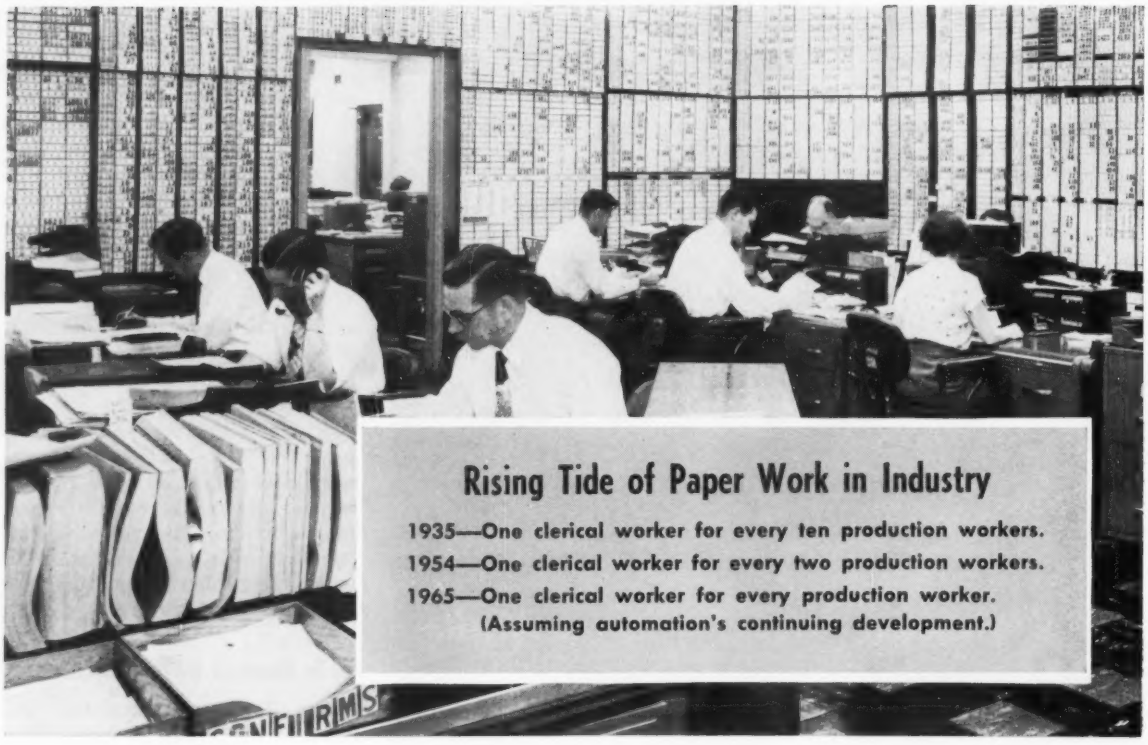
An increase in private U.S. investment in foreign enterprises is urged by Benjamin F. Fairless, former chairman of U.S. Steel Corp.

Mr. Fairless, co-ordinator of President Eisenhower's Special Mutual Security Advisory Committee, told the Business Advisory Council of the Department of Commerce that $3.7 billion is so invested now. He said that an increase would reduce the cost of mutual security.

Tests High Content Peru Ore

Granite City Steel Co., Granite City, Ill., is testing Peruvian iron ore (59 per cent, about 7 per cent higher than domestic ore) in its blast furnaces.

The ore (5600 tons) was purchased from Marcona Mining Co., Ica, Peru. It was the first foreign ore to be brought into the St. Louis area.



Rising Tide of Paper Work in Industry

1935—One clerical worker for every ten production workers.
1954—One clerical worker for every two production workers.
1965—One clerical worker for every production worker.
(Assuming automation's continuing development.)

Paper Work Chokes Profits

GE consultant warns industry that outmoded techniques in administration can ruin business. He urges careful research to avoid unnecessary clerical procedures

RED TAPE in business too often becomes red ink, says W. Clayton Hill, consultant, marketing administration, General Electric Co.

Speaking before the National Industrial Conference Board's meeting in New York, Mr. Hill termed red tape "a binding that holds together a business and serves as the nerve system of the entire operation."

Paper Happy — But he warned "this mountain of paper work is increasing at a terrifying rate." Mr. Hill quoted the Department of Labor to the effect that there were 8 million clerical workers in the U.S. in 1954. One in eight workers (almost 13 per cent of the labor force) did clerical work. Their combined annual salary was $35 billion (11 per cent of all payrolls in 1954).

"The clerical population has been multiplying five times faster than the total population," he said. "When the time comes that it takes more administrators than producers to keep business going, the wagon could well break down."

If the present rate of increase in clerical workers continues, there will not be enough people for this task by 1965, he said. Our population (about 165 million today) is expected to increase to more than 190 million by 1965.

Shrinkage—Those in the 20 to 65 age bracket will grow only 7 million by 1965, he continued, and the 25 to 45 group will shrink by 2 million. "Total population will increase 15 per cent, working population increase 4 per cent," he said, adding:

"A company that wants merely to maintain its competitive position in its own industry must be able to produce 40 per cent more in 1965 than it does today without an increase in hours worked."

Cut in Profits—A saving of $5000 in administrative expense to a company netting 5 per cent on sales is equal in net income to $100,000 of sales billed, he said. Mr. Hill added that administrative expense was a big factor in lower profits despite higher sales in 1956.

The National Records Management Council reports that the average cost of a business letter is $1.50. At this rate, a company spends $1550 to fill a single file drawer and $6200 to fill the standard four-drawer cabinet, plus $220 annual handling cost.

Squirrels — "Record consultants have found 7 to 15 file drawers per employee in many representative companies," he said. "We have be-

come experts at squirreling away papers and records. When sifted, most are found to be worthless."

He quoted an executive of a nationally known firm who said that his company ships a greater tonnage of paper to scrap dealers than it does products to dealers.

Research — Citing many industrial products that have resulted from engineering and scientific research, Mr. Hill said that the same attitude must be adopted toward business administration.

"This is why I believe administrative system studies on a broad and continuous basis are essential. Ways and means must be found to work easier, but more efficiently, using brains and not brawn."

Input-Output — All paper work basically stems from input and output data, he continued. The usual business divisions (engineering, manufacturing, marketing and financing) frequently pose an administrative problem since the paper work must flow through all functions from input to output.

Intelligent research, he added, must look carefully and objectively at every section of the business enterprise as well as the whole operation and have the ability to discard the old for the new.

Computers—Many times an executive gets the idea that computers are fashionable and the mark of advanced professional management, said Mr. Hill. If an administrative system is so cumbersome that it takes two days for data to reach the computer and another two days for the result to get back, no expense is saved by getting the answer in minutes.

"A system analysis to study the feasibility of a computer is often more valuable than the computer itself," he said. "Often it will show that no computer is needed. Furthermore, with the data accumulated from a sound administrative systems study, firms see ways of speeding work flow, or of eliminating unnecessary operations, merely through changing the system."

Kelsey-Hayes Buys Plant

Kelsey-Hayes Co. purchased the government built and owned jet blade plant on the Utica Drop Forge & Tool Division's Yorkville, N. Y., property.

Showroom Selling Pays

Machine tool distributor using the technique reports healthy gains in backlogs and shipments. System gives salesmen time to keep close check on needs of prospects

A MACHINE TOOL distributor is using the showroom approach to selling. Harrington-Wilson-Brown Corp., Mt. Vernon, N.Y., provides a display room for its 14 sales engineers. They are backed up by a complete and continuing market analysis and four trained maintenance men.

Results: Backlogs, as of Apr. 1, were running 20 per cent ahead of those in the corresponding period of 1956. First quarter shipments were almost 300 per cent ahead of those in the first three months of last year.

Approach — Salesmen are not given geographical territories. Over 5500 metalworking companies in New York, northern New Jersey, and Connecticuit were surveyed and given a letter rating. "A" accounts are called on a minimum of once a month; "B," once every three months; "C," every six months; "D," once a year. H-W-B's 14 sales engineers are given a proportionate share of each classification.

Each record card contains such information as types of machinery and age of equipment. Call reports and progress notes are recorded on the individual cards. "The result," says John Daum, president, "is that our sales staff spends it time where it can be of the most use. Salesmen continually reclassify potential buyers as they become better prospects."

Prestige—A permanent showroom helps build prestige. Prospective buyers are invited in to see machines in operation. Annual shows (as many as 50 machines have been exhibited by 16 machine tool manufacturers) spur sales, too.

Having trained maintenance men helps save the customer and builder money. For installations or repairs during the guarantee period, H-W-B repairmen receive $50 to $75 a day, plus travel allowances from the builders.

Cost Less—After the warranty period, the customer is charged $65 a day for repairs, plus mileage and toll charges. Advantages: 1. The maintenance men are available immediately. 2. Spare parts are usually in stock at the distributor's headquarters. 3. Machine down time is reduced. 4. It costs less.

Harrington-Wilson-Brown Corp. made a sale when it brought potential customer in to see this machine in action. Shows also help sales

How Great Lakes Steel *inspects scrap* quality

Two things don't belong in this gondola—and a team of trained Great Lakes Steel scrap inspectors is searching them out. The intruders are *non-ferrous material* and *high sulphur content ferrous material*, which contaminate heats and spoil the quality of finished steel.

Additional visual inspection in the stockhouse and on the open-hearth floor, magnetic screening, and weight checks all combine to detect and eliminate these adulterants, before the scrap is fit to become a part of Great Lakes steel.

Sound like a lot of trouble? It's worth it, to us and to our customers. And it's just one more step in Great Lakes Steel's continuing program of quality control that assures you the finest steels. Make it a point to contact your Great Lakes Steel representative for the rest of the story. He's as close as your telephone.

Here approved scrap, in charging boxes on buggies, heads for the open hearths. Quality scrap gives finished steel improved surface and ductility characteristics.

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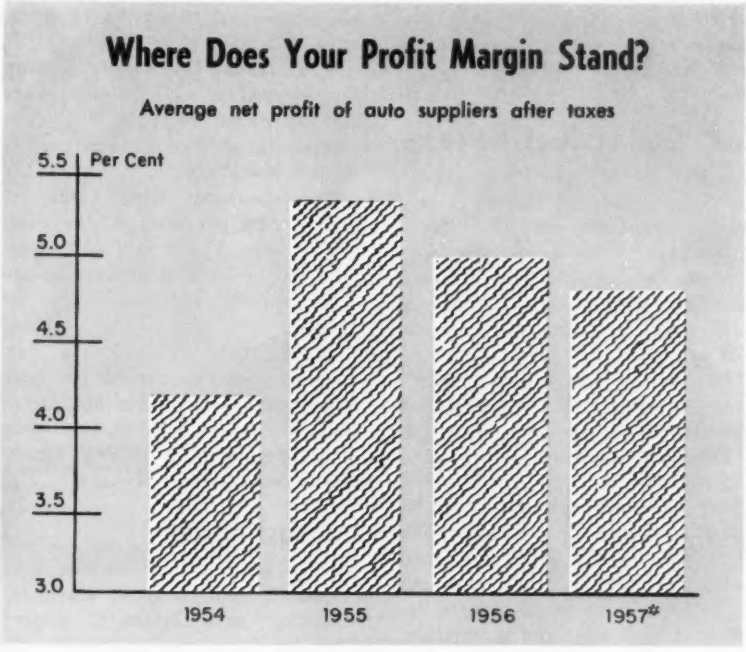

Source: National City Bank of New York.
*Estimated by STEEL.

Autos Farm Half of Parts

But net earnings of all suppliers are carefully watched by Big Three to determine efficiency of operation. Too much or too little goes against outside firm

SUPPLIERS who wonder if they're getting a fair share of the auto makers' business might check their profit margins against the chart above.

It's based on annual surveys of 50 to 70 of the leading auto suppliers in the country.

The average net income of the combined companies was $198,882 last year, compared with $215,820 in 1955.

That's an 8 per cent drop in net income after taxes.

Compare — An interesting comparison between auto maker and supplier profit margins can be drawn for 1955 and 1956. It offers a clue to what can happen this year.

In 1955, auto and truck builders had a 7.4 per cent return on sales. Last year, it dropped to 5.7 per cent. Average net income was off 36 per cent.

Check this against partmakers' profits on the chart. In 1955's record year, suppliers were 2.1 profit points behind the auto companies. When the going got tough in '56, the difference was only 0.7.

Obvious—That points up what any partmaker knows: In good years, car companies farm out more work. When sales are slow, auto makers pull in jobs to keep captive operations going.

The survey does not cover firms who supply new model tooling. This expense affects profits of the car producers but not of suppliers.

Outlook—Stacking up the last two years against the first five months of 1957, it's becoming more apparent that sales aren't going to be much different from 1956's.

All indications are supplier profit margins won't be better either. They probably will be slightly lower since the auto companies have put four major parts plants into production this year.

The contracts that are being farmed out are going to firms which have shown they know how to operate efficiently. Those not in that category are being dropped. Most of them, unfortunately, seem to be smaller outfits.

Watchbirds — Don't think auto makers haven't kept tabs on who has sharpened up in the last few years. Purchasing analysis sections of the Big Three keep their own profit charts on suppliers.

A company that suddenly shows an oversize return on its investment is apt to have future bids closely checked.

Suppliers who list profit levels consistently below the average of their competitors likely are plagued by poor management and debts. They, too, will be on the ineligible list.

Needs—GM still depends on outside sources for 51 per cent of its parts. Ford buys 59 per cent outside, and Chrysler places orders for 65 per cent. The independents solicit bids for 70 per cent of their parts.

Frank Rising, secretary, Automotive Parts Manufacturers Association, Detroit, says: "These percentages haven't changed significantly in the last few years, but the business is being traded around." He claims bigger suppliers are as much a threat to small partmakers as the auto companies.

Now Hear This—The Navy has a saying that fits this winnowing process: "Shape up or ship out!"

Suppliers who meet the industry's growing concept of business-

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like operations can make a good living (STEEL, Apr. 15, p. 75).

But auto makers are deciding there's no place for partmakers who want to fatten up too fast.

UAW Eyes Utica

The United Automobile Workers plans to press seniority application rights of laid off Packard employees who would like to go back to work at the old Packard engine plant, Utica, Mich.

Ken Morris, UAW Region 1 director, says negotiations between the union and Curtiss-Wright Corp., Dayton, O., will open up soon. C-W has owned the Utica facility since it went into a management agreement with Studebaker-Packard Corp. last year.

Some 800 workers are employed at Utica, but the number is expected to climb to about 2000 shortly.

Curtiss-Wright has picked up several defense contracts, and it has announced a jet engine for commercial use. There are 500 to 600 ex-Packard employees in the Detroit area who are unemployed, the UAW estimates.

Revise Car Output

Car builders now expect to sell about 5.8 million passenger cars and 900,000 trucks in 1957.

If next year's models open strong, sales may be a bit higher, says Harlow Curtice, GM president, and Henry Ford II, president, Ford Motor Co.

The executives offered the revised forecasts at stockholder meetings. Previous estimates of auto sales have been in the neighborhood of 6.5 million.

Messrs. Ford and Curtice say the anticipation of a spring sales rush, which didn't come, is responsible for the false forecast. They admit market analysts still aren't sure whether the lack of spring sales is a two-year coincidence or the beginning of a new trend (STEEL, Apr. 29, p. 135).

As previous reports have indicated, GM is suffering most this year. Mr. Curtice says that for the first half of this year his company's total production will be about 9 per cent less than it was in 1956's first half.

Ford has improved its position. Mr. Ford told his stockholders that company sales are 14 per cent ahead of last year's in the first four months. "The industry as a whole has suffered a 3 per cent sales decline during this time," adds Mr. Ford.

GM Workers Get Raise

A 6 cent an hour wage boost for 350,000 General Motors hourly workers went into effect May 29.

It's part of the company's wage formula which has added more than 69 cents per hour to base pay since 1948, says Harlow H. Curtice, GM president.

Current average hourly earnings for GM workers are $2.54. Last year the hourly average was $2.59.

Ford and Chrysler are expected to announce similar rates soon. Their averages probably will be slightly higher than last year's since total employment has held fairly high so far. GM has laid off several thousand employees because of slow sales and production.

Willys Aims at Far East

Willys-Overland Export Corp. hopes to expand overseas markets even more. To promote business in the Far East, the Willys Motors subsidiary is holding a Tokyo sales meeting for dealers, distributors and representatives from 14 countries.

J. C. Delaplain, vice president and general manager of the overseas operation, says the Far East represents a $20 million annual market for Willys.

The company would like to double this potential in the next five years. That's the pattern it followed in Latin American operations and to a lesser extent in Europe.

"Last year, sales in the Far Eastern countries ran 32 per cent ahead of 1955's," adds Mr. Delaplain.

"Reopening the Suez Canal should stimulate 1957 sales."

U.S. Auto Output

Passenger Only

	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,617
4 Mo. Total	2,341,252	2,290,551
May		471,617
June		430,373
July		448,876
August		402,575
September		190,726
October		389,061
November		581,803
December		597,226
Total		5,802,808

Week Ended	1957	1956
Apr. 27	123,633	127,189
May 4	119,999	112,705
May 11	125,924	105,552
May 18	127,390	105,763
May 25	127,366†	108,126
June 1	88,900*	77,451

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Exhaust Notes

• "The shortage of nuclear scientists is today's most alarming statistic," says James C. Zeder, Chrysler Corp. vice president, engineering.

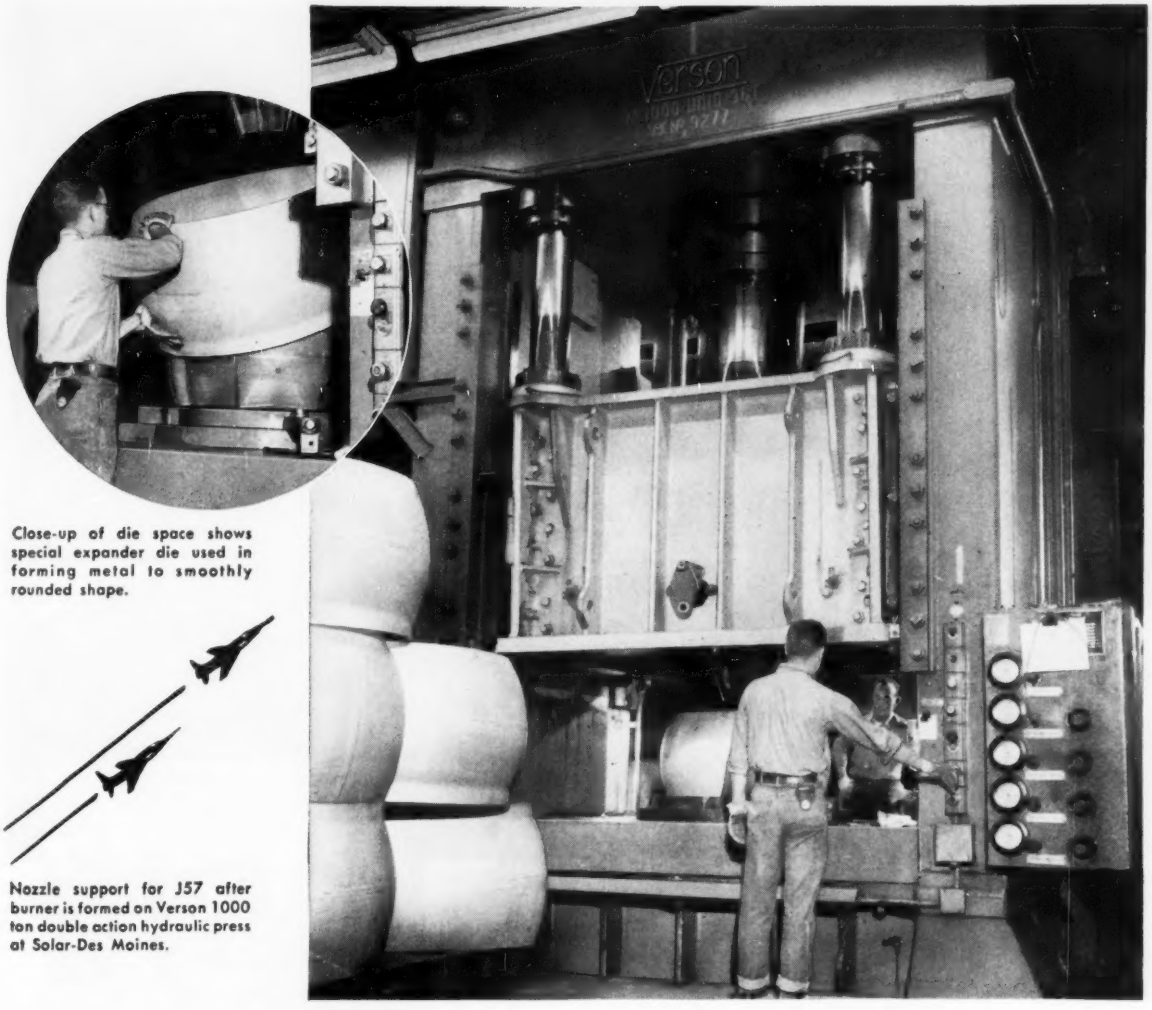
• Despite talk of a pickup, Detroit area mills indicate auto steel buying still is slow. Stainless and cold-rolled strip are exceptions—even though orders for them are spotty. Detroit's operating rate is 86.9, compared with 93.5 a year ago.

• Jaguar has introduced two sports cars with four-wheel disc brakes. The cars, a convertible and a hardtop, are called XK-150s. Both can hit 135 mph.

• Goodyear Tire & Rubber Co., Akron, has one answer to the problem of excessive tire inventories. Its Super Rib industrial tire can be used on a variety of vehicles, including boat trailers, mine cars and fork lift trucks.

• American Motors' Metropolitan has boosted four months' sales totals 92 per cent over last year's figures. Through the first ten days of May, 3602 of the economy cars had been sold, compared with 1876 last year at the same time.

• In case you've wondered, Volkswagen's Karmann-Ghia coupe has a total delivered price of about $2600. The K-G is a custom body on a VW chassis. Only hitch: Delivery takes a year.



Close-up of die space shows special expander die used in forming metal to smoothly rounded shape.

Nozzle support for J57 after burner is formed on Verson 1000 ton double action hydraulic press at Solar-Des Moines.

Another TRADE Verson MARK Press proves its versatility

. . . forming jet engine components at Solar Aircraft Company

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The double action press, largest of its type at Solar-Des Moines, has proved a rugged and versatile production tool. In addition to the heavy jobs, it handles general production when needed.

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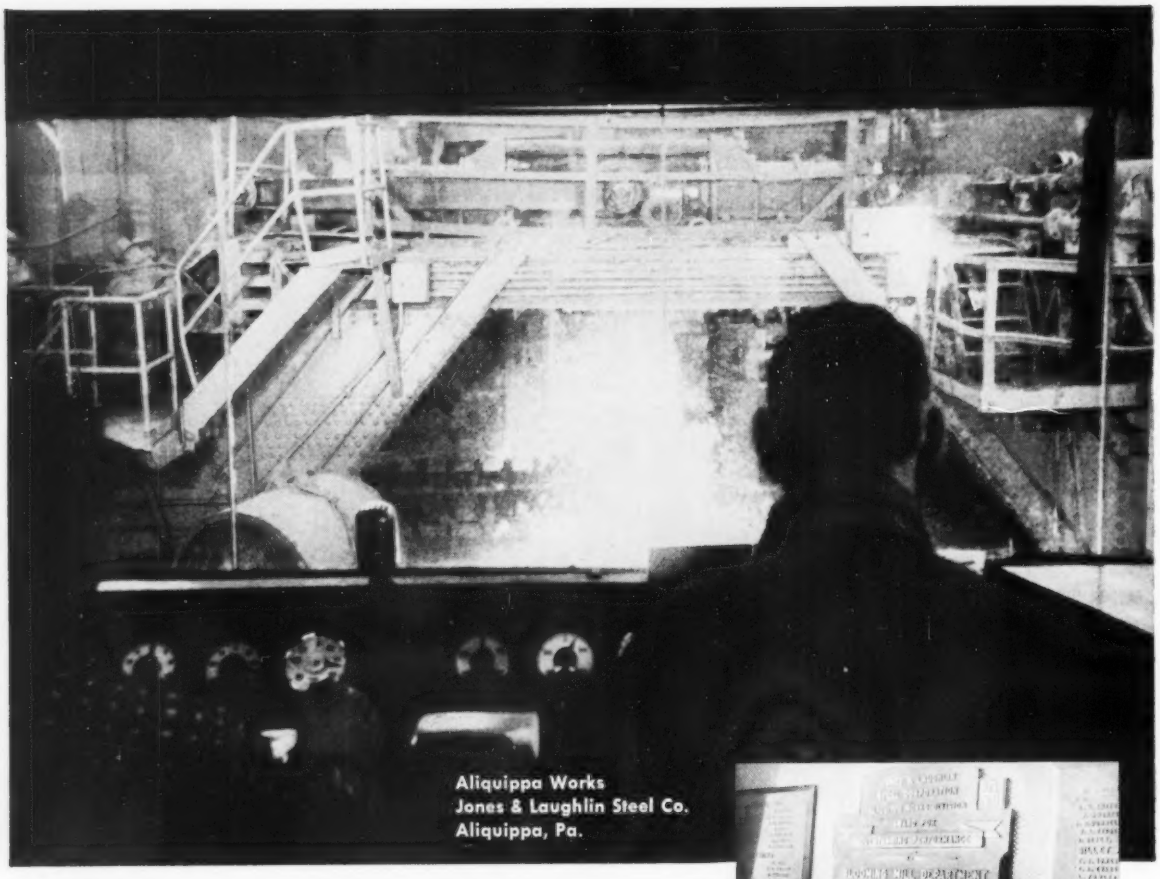

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At Jones & Laughlin's Aliquippa Blooming Mill, they believe in production with a capital "P"!

Not only does J&L's Aliquippa Mill hold the world's record for ingots rolled in an eight hour turn (576), but they've set a year-in, year-out average of an ingot per minute!

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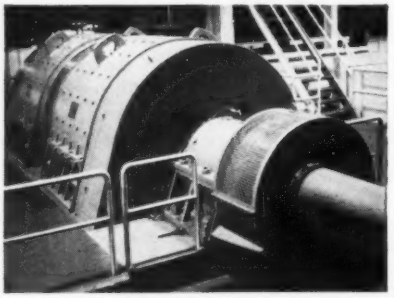
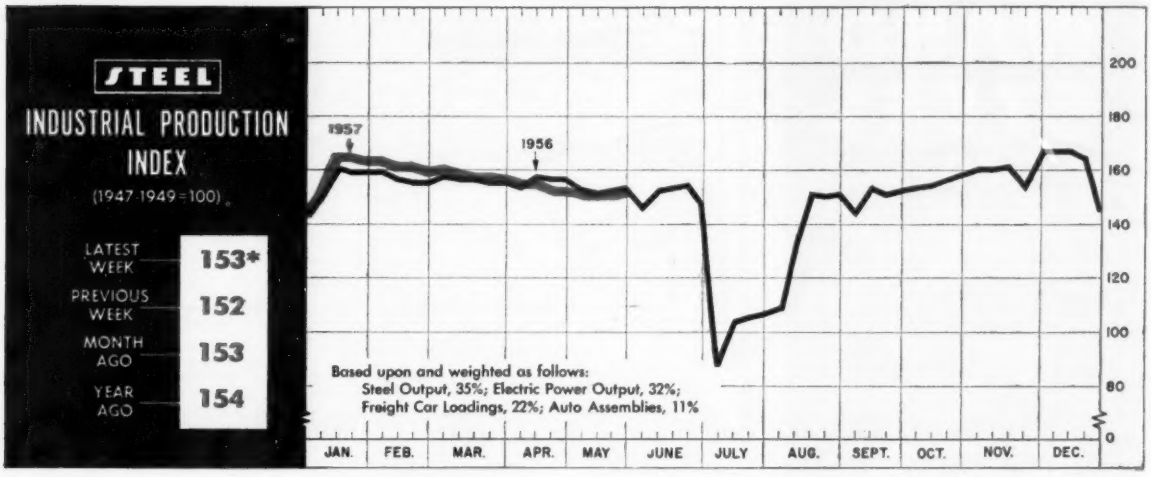
QUALITY PETROLEUM PRODUCTS

Award for 8-Hour Turn Record is displayed proudly outside mill. J&L smashed previous record by 38 ingots—rolled up new total of 576! Year-in and year-out, the plant averages an ingot a minute, with flawless lubrication provided by Cities Service.



Four 3000 h.p. Motors power the blooming mill at J&L's Aliquippa Works. These are 70 to 140 rpm, double-armature units arranged in tandem twin drive. At 70 rpm, they can reverse in under a second. Equally flexible is the mill's lubricant—Cities Service EP-21.



*Week ended May 25.

Seasonal Dip Weakens Business Barometers

A NORMAL seasonal slump, plus the leveling off of many business activities at a near-record pace, has resulted in what appears to be a weakness in the composite of the Business Trend indicators on the following two pages. But don't let appearances fool you. The economy is far from going to the dogs.

Of the 39 indicators tabulated regularly (most of them relate specifically to the metalworking industry), 14 are in an uptrend, 24 are down and one is even with the prior month. (Latest information covers March and April.) Of 38 indicators tabulated five months ago, 18 were going up and 20 were down. (STEEL, Feb. 11, page 71.) Compared with the corresponding month of 1956, 13 are now above and 26 below that position. In February, the ups and downs were evenly divided.

Balancing Act—In most cases, the advantage or disadvantage of current figures is a matter of only a few per cent. Of the indicators common to both studies, only a few held the same relative positions both times. This is indicative of the delicate balance in the high-level economy and of the rolling adjustment that has been the feature of the last half year.

A large portion of the declines is accounted for by just two industries—autos and appliances. Eight of the indicators are tied to autos, nine with appliances. Any appreciable upturn in either industry would change the balance from negative to positive. Also, the composite does not include such broad economic barometers as gross national product, capital goods expenditures, total employment, personal income or construction. All of them show plusses in 1957.

Outlook — There are plenty of signs that the current dip has leveled off and a change for the better is coming. It will be a slight change, just as the weakness has been slight. Many of the steelmak-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,246[1]	2,212	2,370
Electric Power Distributed (million kw-hr)	11,400[1]	11,519	10,927
Bituminous Coal Output (1000 tons)	9,635[1]	9,655	9,800
Petroleum Production (daily avg—1000 bbl)	7,400[1]	7,511	7,071
Construction Volume (*ENR*—millions)	$338.9	$357.7	$310.3
Auto, Truck Output, U. S., Canada (*Ward's*)	159,012[1]	162,538	138,608
TRADE			
Freight Car Loadings (1000 cars)	725[1]	723	788
Business Failures (Dun & Bradstreet)	264	267	279
Currency in Circulation (millions)[3]	$30,645	$30,654	$30,317
Dept. Store Sales (changes from year ago)[3]	−2%	+7%	+6%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,427	$20,681	$22,053
Federal Gross Debt (billions)	$272.6	$273.3	$276.3
Bond Volume, NYSE (millions)	$20.6	$19.1	$19.7
Stocks Sales, NYSE (thousands of shares)	11,179	13,086	11,539
Loans and Investments (billions)[4]	$85.9	$86.1	$85.2
U. S. Govt. Obligations Held (billions)[4]	$25.2	$25.6	$27.1
PRICES			
STEEL's Finished Steel Price Index[5]	228.59	228.59	210.45
STEEL's Nonferrous Metal Price Index[6]	231.5	231.4	276.6
All Commodities[7]	117.1	117.2	114.4
Commodities Other Than Farm & Foods[7]	125.2	125.3	121.7

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1957, 2,559,490; 1956, 2,461,893. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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FEATURE	SIG	2	3	4	FEATURE	SIG	2	3	4
1. Locking signal	Y				9. Accurate analysis locked signalling	Y			
2. Easily moved signal	Y				10. Pocket with wire and acetate lug	Y	Y		Y
3. Protected pocket	Y	Y	Y	Y	11. Pocket lug riding on rail	Y			
4. Pocket tight to lug	Y	Y	Y	Y	12. Frictionless shift of pockets	Y			
5. Positive visibility	Y				13. Perfect layback of pockets	Y	Y		
6. Ease of insertion	Y				14. Roller suspension slide	Y			
7. Quality	Y				15. Group shifting of pockets	Y			
8. Price	Y				16. Greatest card capacity	Y			

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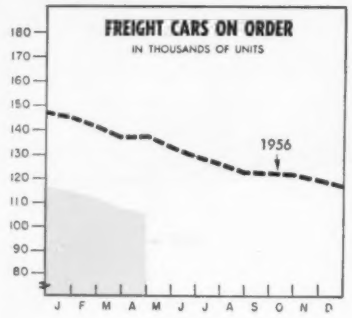
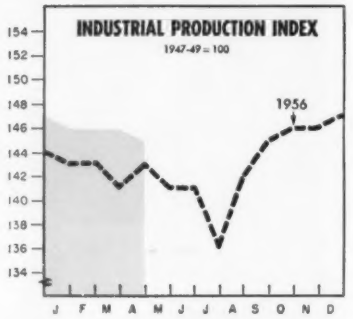
THE BUSINESS TREND





	Awards 1957	Awards 1956	(end of month) 1957	(end of month) 1956
Jan.	5,328	1,818	114,656	144,946
Feb.	6,065	1,675	111,965	141,437
Mar.	5,359	1,618	107,708	137,070
Apr.	6,429	6,559	105,190	137,436
May	....	2,403	.....	133,072
June	....	2,859	.....	129,409
July	....	2,642	.....	126,194
Aug.	....	2,575	.....	122,870
Sept.	....	3,949	.....	122,421
Oct.	....	6,532	.....	122,250
Nov.	....	4,172	.....	119,626
Dec.	....	4,992	.....	117,320
Totals	....	41,794		

American Railway Car Institute.
Charts copyright, 1957, STEEL.

(Seasonally Adjusted)

	Total Production 1957	Total Production 1956	Primary Metals 1957	Primary Metals 1956	Metal Fabricating 1957	Metal Fabricating 1956
Jan.	146	143	144	148	180	170
Feb.	146	143	143	146	180	168
Mar.	146	141	137	145	179	167
Apr.	145*	143	134*	146	177*	170
May	...	141	...	141	...	167
June	...	141	...	138	...	168
July	...	136	...	68	...	169
Aug.	...	142	...	124	...	172
Sept.	..	145	...	148	...	176
Oct.	...	146	...	147	...	177
Nov.	...	146	...	147	...	180
Dec.	...	147	...	145	...	183
Avg.	...	143	...	137	...	172

Federal Reserve Board. *Preliminary.

ers attending the American Iron & Steel Institute meeting in New York agreed that demand is picking up a little. Appliance makers, who have taken several months to pare inventories, are getting set for heavier operations despite some recent reports of layoffs. Some of their optimism is based on an expected seasonal increase in house building. Auto makers expect to continue at the current level of about 150,000 cars and trucks a week through this month, after which they will taper off in preparation for 1958 models.

STEEL's industrial production index also indicates that the bottom of the trough has been reached. After resting for three weeks at 152 (1947-1949 = 100), production edged up to a preliminary 153 for the week ended May 25. Memorial Day will take a bite out of the trend line this week, but the weekly average for June should stack up well with the year-ago period.

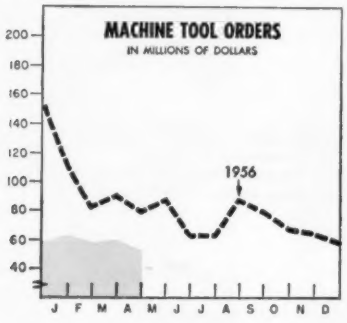
Prices, Wages Rise

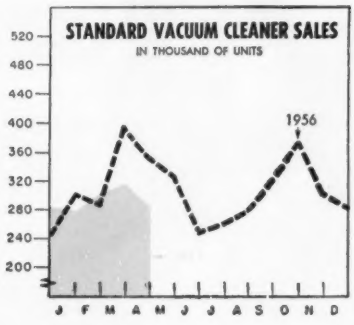
Take-home pay of factory workers declined in April for the first time in 30 months, but this situation will be short-lived. The consumer price index of the Bureau of Labor Statistics advanced to 119.3 per cent of the 1947-1949 base period in April, setting the eighth consecutive record. With it went pay increases of 2 cents an hour to 1.4 million workers in the auto, farm equipment and electrical equipment industries. In addition, auto and some farm equipment workers got a 6-cent annual improvement factor raise June 1.

Outlook Brightens for PAs

Purchasing agents are taking a brighter outlook on business, too. The May survey of the National Association of Purchasing Agents notes that 52 per cent of the respondents think that the balance of 1957 will be better than it has been so far, and 34 per cent think there will be no change. But 32 per cent say that new orders worsened within the last 30 days, compared with only 25 per cent reporting this position in April. The price rise has been halted by competition rather than by a halt in the upward trend of costs, they believe.

Purchasers in Cleveland are a bit more optimistic than their brothers elsewhere. In response to the Cleveland association's inquiry, 79 per cent reported that produc-





(Thousands of Dollars)

	New Orders 1957	New Orders 1956	Shipments 1957	Shipments 1956
Jan.	63,250	109,550	76,550	54,600
Feb.	58,200	81,300	77,700	64,600
Mar.	58,900	89,500	89,100	74,150
Apr.	51,300*	79,300	88,100*	71,800
May	.....	87,100	.....	76,800
June	.....	61,850	.....	76,250
July	.....	61,900	.....	65,150
Aug.	.....	87,500	.....	75,100
Sept.	.....	78,450	.....	71,100
Oct.	.....	66,100	.....	89,750
Nov.	.....	64,250	.....	81,700
Dec.	.....	57,200	.....	85,150
Totals	.....	924,000	.....	886,150

*Preliminary.
National Machine Tool Builders' Assn.

	1957	1956	1955
Jan.	276,738	302,203	248,941
Feb.	300,887	286,386	261,183
Mar.	312,746	395,686	356,444
Apr.	281,627	352,873	241,870
May	.....	326,008	255,941
June	.....	248,326	239,728
July	.....	259,774	206,758
Aug.	.....	276,932	252,491
Sept.	.....	320,278	306,507
Oct.	.....	371,998	349,654
Nov.	.....	300,381	307,267
Dec.	.....	281,625	243,457
Totals ...	.....	3,721,870	3,270,441

Vacuum Cleaners Mfrs.' Assn.

tion was the same or better than April's. This is up from last month's survey. Most notable change occurred in new orders. Only 20 per cent reported a drop in May, compared with 33 per cent in April. They agreed with the national group that both employment and inventories are in better position than they were a month ago.

Construction Keeps Pace

Construction, which moderated the business declines of 1949 and 1954, is playing about the same role this year. Contracts for future construction during the first four months of the year totaled $10,314,991,000, virtually the same as in the record-breaking period of last year, reports F. W. Dodge Corp. Contracts in April declined 9 per cent from the year-ago month, which offset the large increase in March. A large part of the April deficit was accounted for by nonresidential building, which was off the 1956 pace by 20 per cent. For the first four months of 1957, dollar value of residential contracts is below the corresponding 1956 figure by only 6 per cent, while the number of units is down 14 per cent. This points up the continuing trend to larger and more costly homes. Dollar value of heavy engineering contracts in April increased 8 per cent over the similar 1956 month's total.

Trends Fore and Aft

- Fabricators of structural steel shipped a record of 313,591 tons in April. The previous record was 306,760 tons shipped in March, 1956. Bookings advanced from 289,103 tons in March to 360,351 tons in April.
- Shipments of commercial steel forgings in March increased to 145,783 tons from February's 135,014 tons.
- New orders for industrial furnaces in April were at the lowest level since last September, totaling only $3,164,000.
- The sales index of the American Gear Manufacturers Association for April is 221.7 (1947-1949 = 100), down 15.5 per cent from the March reading.
- Net new orders received by members of the Resistance Welder Manufacturers Association in April rose slightly to $2,429,178. Shipments also rose to $3,111,150 from March's $2,845,033.

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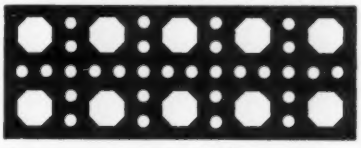

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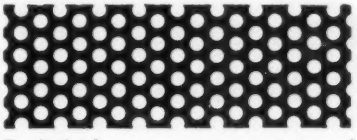

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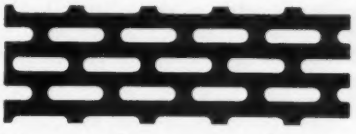

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Die block dimensions: 13'2" x 2'7" x 1'4"
Weight before sinking: 23,830 pounds

Heppenstall Die Blocks reduce sinking time . . . hold close tolerances for these 3500 lb. crankshafts

Reports from Park Drop Forge Company, Cleveland, point out two important performance benefits resulting from the Heppenstall Die Blocks used for this diesel crankshaft job. First, the machinability of Heppenstall's Hardtem Die Steel made it possible to sink the impression in a minimum of costly machining time. In addition, Hardtem's outstanding ability to hold dimensions under the hammer enabled the company to turn out close tolerance forgings throughout the entire production run. Since 1937, when the diesel trend began, the majority of locomotive crankshafts have been Park Drop forgings . . . and most of them from Heppenstall Die Blocks.

Forged on all six faces from special Heppenstall Steel, Hardtem and other Heppenstall Die Steels are manufactured in a wide range of hardnesses to match varying customer requirements of application and machinability. Veteran Die Sinkers know they can select a Heppenstall Die Steel that can be machined to greatest accuracy in minimum cutting time, yet will hold dimensions for maximum production runs. If you're looking for the best possible combination of die block machinability and service life, contact your Heppenstall Representative. He can help you quickly select the one best answer.

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. . . the most dependable name in die blocks

PITTSBURGH 1, PENNSYLVANIA

JOHN PROCOPI
Milton Roy sales manager

JOHN F. CACHAT
works manager at Tocco

R. CARTER DYE
Olin Aluminum gen. sales mgr.

W. G. LANTERMAN
Lamson div. sales mgr.

John Procopi was made sales manager, **Milton Roy Co.**, Philadelphia. He was manager of market development. **H. Rodman Smith** was made assistant sales manager.

John F. Cachat was made works manager, **Tocco Division**, Ohio Crankshaft Co., Cleveland. He was Cleveland district manager.

At the Chicago stamping plant of **Ford Motor Co.**, **E. E. Childs** was promoted to production manager. He succeeds **H. G. Kuehn**, transferred to division headquarters in Dearborn, Mich. **William H. Latta** succeeds Mr. Childs as controller.

Eugene M. Neely succeeds **William M. Bailey** as president, **William M. Bailey Co.**, Pittsburgh. Mr. Bailey becomes chairman, a new post. **J. Russell Miller** was made sales manager.

Aluminum Co. of America appointed **A. R. Van Vorst** manager of impact extrusion sales with headquarters at the Edgewater, N. J., Works. **C. Christy Jones** was made assistant sales manager, extruded shapes and tubing. He is replaced as manager of sales for closures and collapsible tubes by **Robert W. Dispennett.** **H. Roger Richter** was named assistant to the manager of extrusion and tubing sales, with headquarters at the Vernon, Calif., Works.

Loral Electronics Corp., New York, elected these men vice presidents: **Gerson Lewis, Thomas J. McLaughlin, A. Gerald Merlin** and **Sheldon Simon.**

R. Carter Dye was named general sales manager for **Olin Aluminum**, division of Olin Mathieson Chemical Corp., New York. He was acting director of sales, aluminum division.

George W. Stamm was elected vice president, **Crucible Steel Co. of America**, Pittsburgh. He continues as general manager of sales. **James D. Glenn**, former vice president-sales, asked to be relieved of responsibilities due to illness.

M. C. Reed was elected president of **Dunkirk Radiator Corp.**, Dunkirk, N. Y. He succeeds the late **L. N. Murray.** Mr. Reed was vice president-sales.

B. W. Thorpe was made sales manager, power crane and shovel division, **Harnischfeger Corp.**, Milwaukee.

E. K. Smith was named purchasing agent for **Reserve Mining Co.**, Silver Bay, Minn.

Robert H. Morse III, vice president-sales, **Fairbanks, Morse & Co.**, Chicago, was made vice president in charge of budgets and planning. **V. H. Peterson**, vice president-engineering, was made vice president-sales. **John A. Cuneo**, vice president and assistant to the president, was made vice president-foreign operations. **G. R. Anderson** was named chief engineer: **John C. Elmburg**, general sales manager.

Gerald A. Weimer was made chief industrial engineer, **United Steel Fabricators Inc.**, Wooster, O.

Lamson Corp., Syracuse, N. Y., appointed **W. G. Lanterman** manager of sales, industrial division. He was Cleveland regional manager.

Sheffield Corp., Dayton, O., appointed **E. M. Hakanson** manager; **C. H. Laemmel**, assistant manager of its machine tool division. **D. H. McConnell** was made manager, autometrology division.

Arnold L. Rustay fills the new post of technical director at **Wyman-Gordon Co.**, Worcester, Mass. Former director of research, he is replaced by **Marion E. Cieslicki**, former manager of materials engineering at General Electric Co.'s Evendale, O., plant. **Carl G. Bergstrom** was made chief metallurgist; **Chester J. Orciuch**, metallurgical manager.

Armco Steel Corp., Middletown, O., named **Robert P. Hindman** and **William R. Gealey** assistant general superintendents, Armco plant; **Leroy G. Greenert**, superintendent of the rolling department, Butler, Pa., works.

James O. Clevenger, former sales manager for **Westinghouse Electric Corp.'s** general products at Pittsburgh, was named general manager, **Bryant Electric Co.**, subsidiary at Bridgeport, Conn. He succeeds **L. N. Goodell**, now manager, electrical products department, at Westinghouse's Sunnyvale, Calif., manufacturing division.

Ralph M. Parsons Co., Los Angeles, appointed **H. W. Thomas** manager

T. F. FLOOD
new duties at Frank G. Hough

LOUIS E. DONDERO
Le Roi plant manager

DAVID S. BURNETT
Detroit Steel Products mgr.

JOHN R. WELSH
American Brake Shoe p. a.

of its industrial department, project development division.

T. F. Flood, vice president-production, **Frank G. Hough Co.,** Libertyville, Ill., assumes additional duties of vice president, sales and manufacturing.

Pittsburgh Piping & Equipment Co., Pittsburgh, appointed **Roy W. Emerson** assistant to the president and general technical co-ordinator; **William J. Titzell,** chief engineer; **William Mellody,** purchasing agent; **A. S. Hamley,** assistant sales manager. **R. J. Koepp,** purchasing manager; and **George Hopkins,** purchasing agent, have resigned.

Lawrence Holzer was made production manager at **International Business Machines Corp.'s** plant in Owego, N. Y.

Ralph R. Rose was made manager, basic refractories project, refractories division, **H. K. Porter Company Inc.** He will co-ordinate the basic refractories plant under construction at Pascagoula, Miss. He was a program manager at E. J. Lavino & Co. **Edgar G. Platt** fills the new post of general works manager, refractories division. He was works manager for the McLain Fire Brick Division. **Charles C. Flory** was made Pittsburgh district sales manager, refractories division.

William F. Foos was made manager of central systems and procedures for **Electric Auto-Lite Co.,** Toledo, O.

Crouse-Hinds Co. named **Gordon Van Dyke Miller** Philadelphia division sales manager.

Louis E. Dondero was named manager of the West Allis, Wis., plant of the **Le Roi Division,** Westinghouse Air Brake Co. He succeeds **Hugh M. Little.** Mr. Dondero was assistant works manager.

Fenestra Inc., Detroit, appointed **David S. Burnett** to the new post of general manager of its Detroit Steel Products Division (leaf springs for automotive industry). He was automotive division sales manager. **E. A. Miller,** manager of the panel division, was elected vice president of the new building products division, in charge of all sales and manufacturing. **W. J. Maurer** continues as vice president-manufacturing of building products, but assumes duties of purchasing and product engineering. **William Gillett,** vice president, assumes the duties of business planning. **Earle C. Hodges** resigned as vice president-building products sales.

Ray P. Powers was named vice president and assistant general manager, **Continental Aviation & Engineering Corp.,** Toledo, O. He was vice president-operations, Studebaker-Packard Corp.

Prof. William H. Graves, College of Engineering, University of Michigan, was elected vice president of **American Forging & Socket Co.,** Pontiac, Mich., to succeed the late **Frederick C. Anger.**

Don C. Atkins Jr. joined **United States Chemical Milling Corp.,** Manhattan Beach, Calif., as assistant chief engineer. He was director of research and development for the chemical milling division of Turco Products Inc.

John R. Welsh was made assistant general purchasing agent of **American Brake Shoe Co.,** New York. He was purchasing agent for ferrous materials.

Rollo Asmussen was elected vice president of **Clary Corp.** He is general manager of its new Searcy, Ark., division.

Richard Schiewetz was made general manager of the new Clarksville, Tenn., plant of **Trane Co.**

Norman F. Garrett was made general manager of **Crane Co.'s** Chicago Works. He succeeds **Gus C. Detlefsen,** retired.

Anthony Del Duca was made chief electronics engineer, **Process Instruments Division,** Beckman Instruments Inc., Los Angeles.

George E. Herrman was made manager of commercial automotive sales, **Aluminum Co. of America.** He is in Pittsburgh.

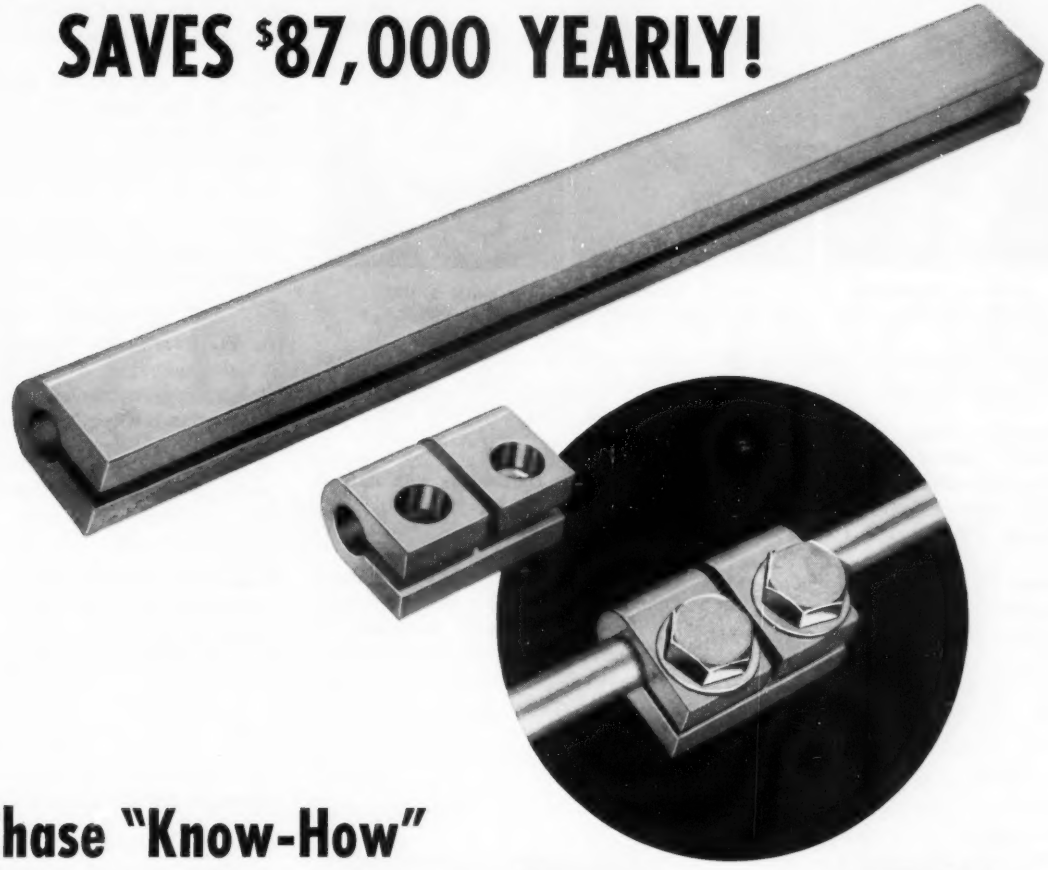
Morlan E. Fiterman was named vice president of **M. A. Young & Co.** in charge of its Chicago office. He was with Luria Steel & Trading Co. as manager of its alloy division and nonferrous metals.

George P. F. Smith, vice president and eastern representative at New York for **Borg-Warner Corp.,** assumes added duties in charge of the Washington office. He succeeds **Karl J. Ammerman,** retired.

Robert S. Sterrett was made manager of the Joliet, Ill., branch of **Matheson Co. Inc.**

Gerald J. Miller was made director

"IMPOSSIBLE" BRASS EXTRUSION SAVES $87,000 YEARLY!



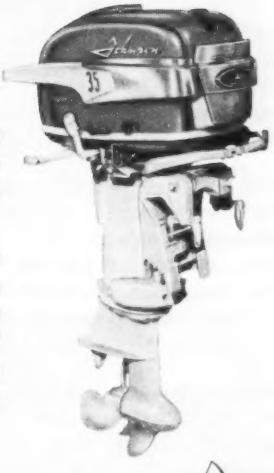
Chase "Know-How" cuts costs for Johnson Motors

(world's largest manufacturer of outboard motors)

The shift-rod connector on rugged, dependable Johnson Sea-horses had to be strong enough to hold up under severe stress and compact enough to operate in the clearances available on smallest engine models.

Stamped parts were completely unsatisfactory. Parts machined from rod were too bulky for versatile applications. So they checked with Chase to find out how closely a brass extrusion could approximate their requirements. And Chase "know-how" came through beyond their expectations!

Chase mill techniques proved to be so precise that the required extrusion *needed no additional machining to cross-sectional dimensions!* Result? An annual saving of approximately $87,000 *plus* a much better design.



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SUBSIDIARY OF KENNECOTT COPPER CORPORATION

The Nation's Headquarters for Brass, Copper and Stainless Steel

Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York (Maspeth, L.I.) Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury

LESTER J. HENDERSON
Republic Mfg. v. p.-sales

JESSE D. MARINO
chief eng., Duquesne Works

PHILIP S. HILL
Hyster executive v. p.

of manufacturing at **Raymond Machinery Corp.**, San Diego, Calif.

Republic Mfg. Co., Cleveland, elected **Lester J. Henderson** vice president-sales. He was general sales manager, special products division, Weatherhead Co.

Jesse D. Marino was made chief engineer at **U.S. Steel Corp.'s** Duquesne, Pa., Works. He succeeds **Charles H. Good**, now assistant to vice president, operations-steel. Mr. Marino was assistant chief engineer.

Ernest M. Whitley was made production engineer for the **Spinco Division** of Beckman Instruments Inc., Palo Alto, Calif.

Jim Colfer was made manager of new products sales for **Metal-Cal**, Inglewood, Calif. **Jim Collins** was made manager-research and development.

Arthur J. Stock was made research and development manager for **Acheson Colloids Co.**, Port Huron, Mich., division of Acheson Industries Inc. He replaces **Dr. Harold J. Dawe**, now research director for Acheson Industries.

James J. Gilligan was made executive assistant to the general manager of **Axelson Mfg. Co.**, Los Angeles, division of U.S. Industries Inc.

Vanadium Corp. of America, New York, named **Lloyd W. Lewis** sales manager, eastern district; **William J. Killian**, assistant district manager, Pittsburgh district; **John J. Green**, manager, wrought steel service, a new post.

Philip S. Hill was appointed executive vice president, **Hyster Co.**, Portland, Oreg. He was vice president-sales.

William B. Denniston was named sales manager of **Panellit Inc.**, Skokie, Ill.

Leonard N. Goodell was named manager of electrical products; **Fenton L. Tippett**, manager of mechanical products for the Sunnyvale, Calif., division of **Westinghouse Electric Corp. Kermit J. Clark** was made manager of manufacturing-electrical products; **John J. McAuliffe**, manager of manufacturing-mechanical products.

Thomas W. King was made national sales manager for **Hydraulic Accessories Co.**, Van Dyke, Mich.

Sheffield Corp., Dayton, O., subsidiary of Bendix Aviation Corp., has given **O. A. Ahlers**, senior vice president, added responsibility, with over-all direction of the machine tool, contract manufacturing and Threadwell-Conway Tap & Die product divisions. **W. Fay Aller**, former vice president-autometrology division, was made vice president in charge of the autometrology, standard production instruments, and fixed gage and inspection instruments divisions. **J. T. Welch**, former general manager, machine tool division, was named assistant vice president for co-ordinating operations of national field sales.

George J. Bruyn was made manager, New England district sales, for **Hooker Electrochemical Co.** He has headquarters at the newly established New England office at 265 Grafton St., Worcester, Mass.

McCulloch Motors Corp. appointed **Cecil T. Benton** plant superintendent of its new Canadian factory, now under construction in Toronto.

Milton S. Angier was made manager of the Toledo, O., branch office of **Westinghouse Electric Corp.'s** apparatus division. He succeeds **J. A. Dinwiddie**, retired.

Ernest T. Weir, retiring chairman of **National Steel Corp.**, Pittsburgh, was elected honorary founder-chairman.

A. W. Roark was named western division manager, **Atkins Saw Division**, Borg-Warner Corp. He is at Portland, Oreg.

R. E. Cornwell was appointed president, **Union Carbide Development Co.**, division of Union Carbide Corp., New York.

Robert A. Lebowitz was made assistant to the manager of manufacturing at **Polytechnic Research & Development Co. Inc.**, Brooklyn, N. Y.

Rudolf Cerny was made sales engineer, **Aerosol Valve Division**, Sun Tube Corp., Hillside, N. J., responsible for sales and service.

Dave N. Allensworth was named to direct sales of industrial tube and hose fittings in the Los Angeles district for **Parker Appliance Co.**

Turco Products Inc., Los Angeles, named **Carl F. Graham** director of research and development.

OBITUARIES...

Leon A. Doughty, 70, cofounder and president of **C & D Batteries Inc.**, Conshohocken, Pa., died May 18.

Herbert E. Oatis, 62, owner of **Oatis Machinery Co.**, Toledo, O., died May 12. He also was vice president of Mill & Factory Supply Co.

Clifford H. Peterson, 50, chief engineer, **Soule Steel Co.**, San Francisco, died May 14.

Marvin F. Pixton, 65, vice president-treasurer, **Ingalls Iron Works Co.**, Birmingham, died recently.

GRAY IRON AND DUCTILE IRON—

Heat treated or as cast

UNIFORMITY
UNIFORMITY
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UNIFORMITY
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UNIFORMITY

LYNCHBURG FOUNDRY

SHELL CASTINGS

Uniformity is all-important in this agricultural gear—that's why it is specified to be shell molded by Lynchburg Foundry.

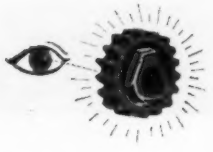
First, consider the advantages of shell molding for gear teeth, as demonstrated in this case. The allowance for backlash is held to a minimum because of the uniformity, smooth surface, and reduced draft. Further, such gears ordinarily must go through a break-in period to smooth the surfaces of the teeth. This was eliminated by casting in shell.

In the bore only a reaming operation in a floating fixture is necessary, because of the excellent concentricity possible through shell molding.

If uniformity is a must for component parts in your shop, it will pay you to specify Lynchburg Foundry shell castings.

LESS MACHINING—Close control of dimensions means less machining, faster machining methods, or in some instances elimination of machining altogether.

MADE FOR LIGHT TRAVEL—Less machine stock means reduced weight—lowering transportation costs both in shipment and within the factory.



SUPERIOR SURFACE FINISH—Shell castings have "eye appeal"—their surface dresses up any finished product. Further, a smooth finish reduces wear on machine tools.

LFC

LYNCHBURG FOUNDRY COMPANY

LYNCHBURG, VIRGINIA

•

DISTRICT SALES OFFICES

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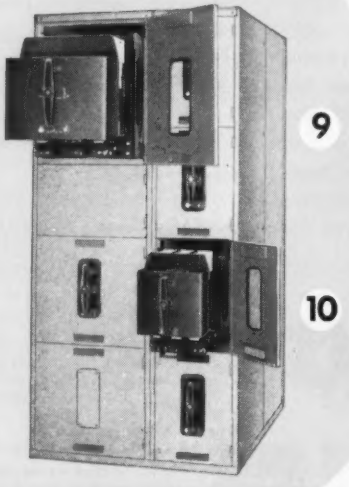
MATCHED INSTALLATIONS WITH SQUARE D *POWER-STYLE* LOW VOLTAGE SWITCHGEAR!

Control Centers, Unit Substations or Switchboards—
They All Match! They're POWER-STYLE Construction, Too!

DESIGN LEADERSHIP FEATURES

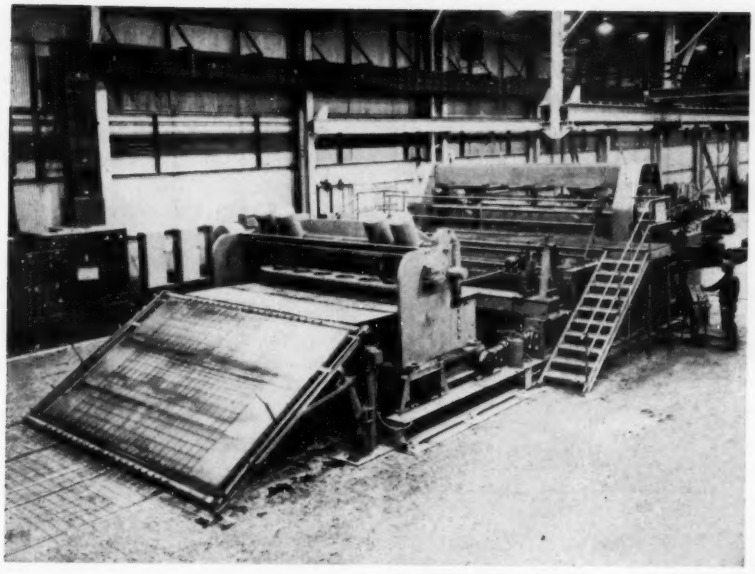
1. New design Type LA circuit breakers with T type handle for easier manual operation
2. Hinged doors provide ready access to circuit breakers
3. Fully equipped compartment for future breaker
4. Four 225 ampere LA-15 or 600 ampere LA-25 circuit breakers can be mounted in an 18″ wide vertical section
5. Three 1600 ampere LA-50 circuit breakers can be mounted in one 26″ wide vertical section. Wider sections are available for higher capacity breakers—34″ for 3000 ampere and 40″ for 4000 ampere
6. Enclosure is 91-½″ high and 54″ deep. Durable, baked enamel blue-gray finish over rust-inhibiting primer
7. Instruments and meters on hinged door of isolated compartment



8. Circuit breakers are mounted on positive pantograph drawout mechanism which holds breaker in *connected, test, disconnected,* or *fully projected* position
9. Bussing is silver plated and braced for 50,000 ampere minimum. Arranged to provide adequate space for cables
10. Pantograph drawout mechanism projects breaker beyond front of switchgear—permits easy inspection of disconnect contacts without breaker removal. When desired, breaker can easily be lifted from pantograph mechanism

EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE

SQUARE D COMPANY



AS&W Installs "Industrial Spider"

This machine has been set up at the Cuyahoga Works, Cleveland. It will produce 1700 tons of welded wire fabric a month. Dimensions: 1 to 16-in. squares in widths up to 13 ft

WELDED WIRE fabric is being produced in the Cleveland district (see photo above) at the Cuyahoga Works of U.S. Steel Corp.'s American Steel & Wire Division. A second machine will be in production "within the next few weeks," say company officials.

At capacity operation, each machine will produce some 1700 tons of welded fabric a month. Widths will range up to 13 ft.

The machines, known as "industrial spiders," are more than 10 ft high and 132 ft long. Mounted to the rear of the machines are 49 reels containing 2 to 4 miles of wire.

Automated—Welded wire fabric is composed of longitudinal and latitudinal, or transverse, wires spaced from 1 to 16 in. apart. As the wires enter the machine, mechanical fingers position them, and sets of electrodes weld them at the cross points.

The material finds wide use in city streets, highways, office buildings and bridges. It is used also to reinforce concrete pipe, sidewalks, basement floors, swimming pools, patios, garage floors and grain cribs.

A building was erected to accommodate the "spiders." It includes an enclosed railroad siding and truck dock. Two overhead cranes were installed to transport the fabric from the machines to the storage area which has a capacity of 750 to 1000 tons.

Will Build Atlanta Warehouse

Atlantic Steel Co., Atlanta, will build a $150,000 warehouse in that city for storage of aluminum products. Later on, the facility will be enlarged for the distribution of steel products.

Starts Producing Steel Wheels

Griffin Wheel Co., a subsidiary of American Steel Foundries, Chicago, has started to manufacture EQS cast steel wheels for railway freight cars at Colton, Calif. The company makes the electric furnace steel product in permanent graphite molds, using a unique pressure-pouring system. The Colton plant has an annual capacity of 120,000 wheels. Griffin has eight other plants which produce chilled iron wheels for railroads.

Ryerson Enlarges Warehouse

Joseph T. Ryerson & Son Inc. will increase the capacity of its Pittsburgh steel service plant by more than one-third. Cost of the building, machinery and other operating equipment is estimated at about $1 million. The project will bring the floor area in the Pittsburgh district to more than 200,000 sq ft. A. L. Peterson is general manager.

Carmet Division Opens Plant

Allegheny Ludlum Steel Corp.'s Carmet Division has started operations in a new plant at Bad Axe, Mich., in preparation for the production of cemented carbide mining tools and standard lathe tools. It is the first Carmet Division production unit outside the headquarters plant in Ferndale, Mich. Operations will include milling, drilling, sawing, brazing, degreasing, induction heating, grinding, sand blasting and heat treating.

Plans Ore Concentrate Plant

Aconic Mining Corp. plans to install a second million-ton-capacity plant to produce ore concentrates from its iron sands at Natashquan, Que. The $5-million installation is scheduled to be operating by late 1958 or 1959. Gross production capacity would be increased to about 2,250,000 tons of concentrates a year.

Penn Precision Orders Mill

Penn Precision Products Inc., Reading, Pa., awarded a contract to Loma Machine Mfg. Co. Inc., New York, for a Rohn type, 20 high, reversing, cold rolling mill to process ultrathin strip, ranging down to 0.000125 in. and in widths up to 4.25 in.

Ideco Division Renamed

Ideco Division of Dresser Equipment Co. has been reorganized and renamed Ideco Inc. It makes drilling rigs and other oil well drilling equipment. Officers of this Dallas firm are: President, G. W. Walton; vice president in charge of engineering and manufacturing, W. O.

Cook; assistant to the president and vice president in charge of export sales, G. G. Wilbur; vice president in charge of domestic sales, E. F. Shiels.

Opens Die Set Warehouse

A new die set assembly warehouse has been opened at 13620 Enterprise Ave., Cleveland, by Producto Corp. Charles W. Scheihing is manager .

Enlarges Plating Facilities

Los Angeles Plating Co. is constructing a 10,600 sq-ft building adjacent to its facilities at 6921 Avalon Blvd., Los Angeles, to increase its plating facilities.

Mass-Producing Thin Strip

Stainless steel strip rolled to ultrathin gages for the manufacture of dials, nameplates and related items, is being mass-produced by American Silver Co., Flushing, N. Y.

Mutual Steel Builds Plant

Mutual Steel Co. is erecting a $175,000 steel fabricating plant near Grasselli, Ala. It will more than double the size of the company's Birmingham operation.

Newcomer Opens Sales Office

Newcomer Products Inc., Latrobe, Pa., opened a sales office at 1820 E. 79th St., Chicago 49, Ill. The firm's products include carbides, carbide tools, toolholders and milling cutters.

Plant Features Cleaniness

Fafnir Bearing Co., New Britain, Conn., has completed construction of a dustproof instrument bearing assembly and inspection facility. Officials claim it is the world's cleanest metalworking factory area. The million-dollar construction program will make it possible for the firm to double its production of instrument ball bearings. Instruments used in jets, missiles, radar and computers are dependent upon small ball bearings. An invisible speck of dust (0.000008 in.) can cause enough friction in a bearing to throw a missle off course.

Acme Chain Corp. Moves

Acme Chain Corp. moved into its new $800,000 building in the Springdale Industrial Park, Holyoke, Mass. Officers include Carl E. Johnson, president, and H. E. Pihl, vice president and treasurer.

CONSOLIDATIONS

Foote-Burt Co., Cleveland, acquired **A. P. Schraner Co.** and its leased assets. The purchase includes physical property and the right to the name "Schraner," together with patent rights covering the Schraner external cylindrical lapping machines and external roll burnishing machines. Foote-Burt will operate in the present building at 3338 Payne Ave., Cleveland, but ultimately will combine this operation, the Schraner Division, in its main plant.

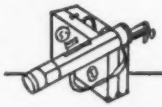
Subject to approval by stockholders, **Master Electric Co.**, Dayton, O., will merge with **Reliance Electric & Engineering Co.**, Cleveland. Master Electric produces electric motors and generators. Reliance makes electric motors, variable-speed motor drives and electronic components.

Arwood Precision Casting Corp., New York, is expanding its west coast operations through the purchase of **Duncan-Rohne Co.** and **Malco Metal Products Co.**, both of North Hollywood, Calif. Duncan-Rohne is a large producer of nonferrous investment castings. Arwood's present west coast operations include a plant for making steel investment castings, a sales organization and engineering staff.

Hayes Industries Inc., Jackson, Mich., purchased **Nameplate & Monogram Co.**, Wapakoneta, O., manufacturer of decorative hardware for the household appliance industry.

ASSOCIATIONS

Purchasing Agents Association of Chicago elected these officers for fiscal 1957-58: President, H. C. Kopp, Anaconda Co.; first vice president, Seymour Ellison, Perfection Gear Co.; second vice president, J. C. Frehner, Bowman Dairy Co.; treasurer, H. H. Wise, Cenol Co. Inc.; and secretary, L. R. Seen, Borg & Beck Division, Borg-Warner Corp.



VACATIONS

Kerr-Lakeside Industries Inc., Euclid, O., will be on vacation from July 3 to July 22. A minimum force will take care of important or emergency work.

Plants of the **Industrial Mfg. Division of Nopco Chemical Co.** and its subsidiary, **Metasap Chemical Co.**, will be shut down for vacations. Here is the schedule: Harrison, N. J., June 28 to July 15; Cedartown, Ga., Aug. 9 to Aug. 26.

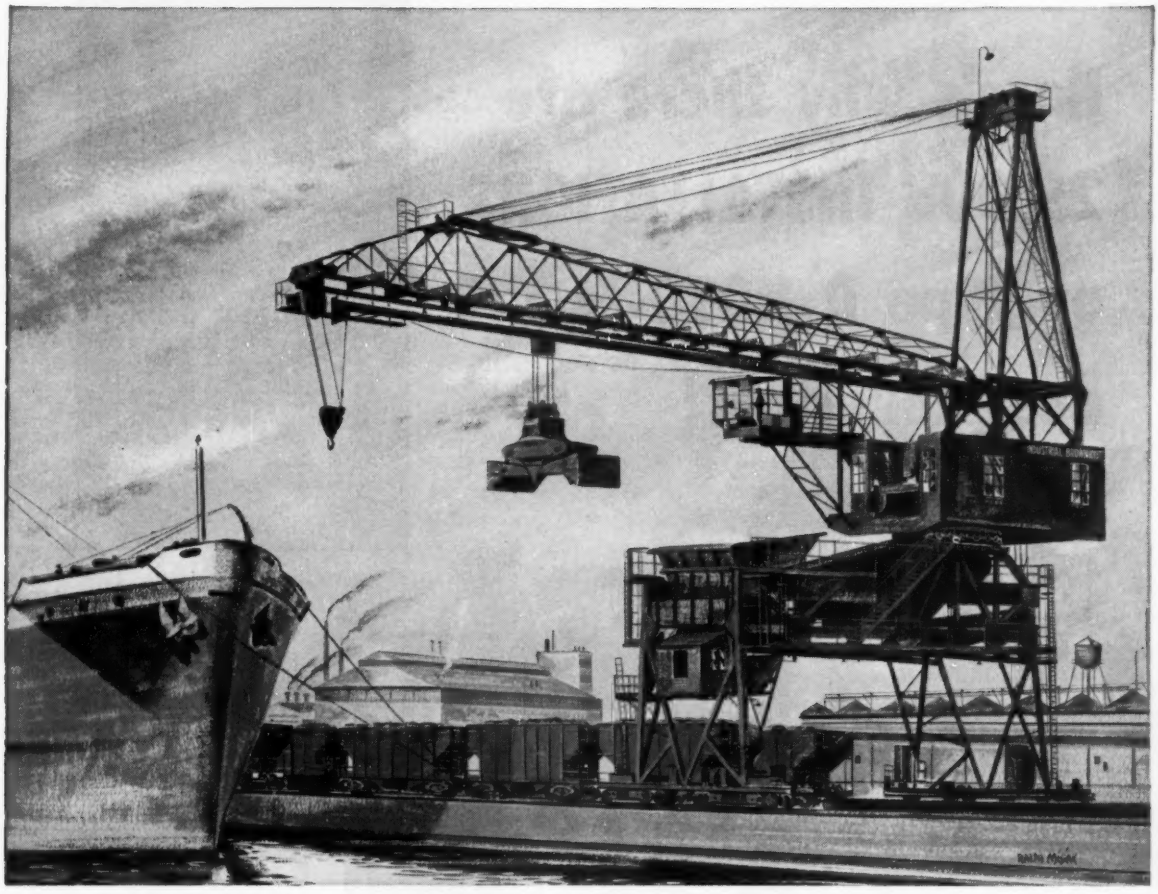
NEW ADDRESSES

Turchan Follower Machine Co. moved into its new plant at 26950 Van Born Road, Inkster, Mich.

Kerr-Lakeside Industries Inc., Euclid, O., moved its offices to 902 E. 222nd St., that city. The factory remains at 21850 St. Clair Ave., Cleveland 17, O. Several new machines have been added to enable the firm to make its products in larger sizes (capscrews up to 3.5 in. in diameter and hand screw machine products up to 4 in. in diameter).

Manufacturing and sales activities of **Grand Rapids Store Equipment Co.** have been transferred to its factory at 3800 S.E. 22nd Ave., Portland, Oreg.

Gemco Mfg. Corp. (formerly Gasoline Equipment Mfg. Co.) will move July 1 to larger quarters at 916 Harrison St., Indianapolis, Ind. The firm makes steel tanks, pressure vessels and process equipment for many industries.



how 75 ton BROWNHOIST combination crane will greatly increase GALVESTON port facilities

The latest type combination boat-unloading crane being engineered and built by Industrial Brownhoist in Bay City, Michigan will substantially improve facilities in the Port of Galveston's 1957 expansion program.

This big, fast-working Brownhoist crane loads or unloads bulk materials from ship-to-cars or cars-to-ship at the remarkable rate of 540 tons per hour! Equipped with 75 foot boom, on which travel both a hook and a Brownhoist-made, 80 cubic foot flush link-type bucket. The entire unit straddles three railroad car tracks located on the pier.

In addition to boat unloading equipment and material handling bridges, Industrial Brownhoist manufactures Diesel-Electric locomotive cranes from 25 to 90 tons, and railroad cranes up to 250 ton capacities. If your firm can profit from reliable, high-speed, high-capacity material-handling equipment, write for new general Catalog No. 562.

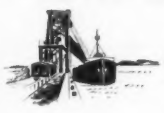
201

BROWNHOIST

CLAMSHELL BUCKET

250 TON WRECKING CRANE

COAL-ORE BRIDGE


CAR DUMPER

LOCOMOTIVE CRANE

INDUSTRIAL BROWNHOIST CORPORATION, BAY CITY, MICHIGAN • DISTRICT OFFICES: New York, Philadelphia, Cleveland, Chicago, San Francisco, Montreal, Canada • AGENCIES: Detroit, Birmingham, Houston

SUBSIDIARY OF Penn-Texas

Here's why there are 25,000 INSTALLATIONS of Type D ROTO-CLONE dust collectors!

1—CONTINUOUS OPERATION
Performance at peak efficiency without interruption. Will operate around the clock —day after day.

2—GREAT FLEXIBILITY
Variety of sizes for any exhaust requirement. Sizes with capacities ranging from 1,000 to 15,000 cfm. "Package" design allows relocation at minimum expense.

3—RUGGED CONSTRUCTION
Cast iron housing, numerous closely-spaced blades of cold rolled steel. Taper lock hubs. Heavy duty shaft and bearings assure long life.

4—HIGHEST EFFICIENCY
Power-driven impeller imparts dynamic force to dust particles. Efficiency not affected by change in air volume or operating speeds.

5—SMALL SPACE REQUIREMENT
Provides everything you need (except duct connections) in one compact, shop-assembled package—collector, exhauster, motor, drive and dust storage hopper.

6—CONSTANT EXHAUST VOLUME
Proper conveying velocity in ducts and effective dust control at hoods maintained by constant exhaust air volume. Build-up in ducts and escapement from hoods prevented.

FOR MORE DETAILS, WRITE FOR BULLETIN 272A.

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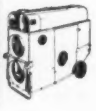
Herman Nelson Unit Heaters



Herman Nelson Portable Heaters

Technical Outlook

HIGH STRENGTH WITH DUCTILITY— People using ultrahigh strength steels in aircraft landing gear and other structures are concerned about getting sufficient ductility. Latest report on the problem comes from the National Bureau of Standards: A modified 4340 steel, made in test quantities, is reported to have "an excellent combination of strength and ductility." Impact resistance is 16 ft-lb at both +70 and −40°F at an ultimate tensile strength of 285,000 psi. Composition of the steel: C 0.40; Mn 0.75; Si 1.60; Ni 1.80; Cr 0.85; Mo 0.30; Ti 0.10; and B 0.003.

PROTECTION FOR MAGNESIUM—Tests have shown that the corrosion resistance of magnesium is greatly improved by vapor plating it with high purity aluminum. Needed now is a satisfactory way of applying the coating on commercial parts.

DE-ICER— A transparent coating of indium oxide that conducts electricity may answer the perennial ice and fog hazard on windshields. Battelle Memorial Institute says the coating, developed for aircraft, can be applied at 250 to 400°F. Previous methods required 800°F which distorted glass. The coating is durable and transmits 85 per cent of the light that strikes it.

LUBRICATING EXTRUSION DIES— Extruders of light metals, particularly aluminum, can save substantially by spraying the lubricant on the extrusion die rather than brushing or swabbing, says the DeVilbiss Co., Toledo, O. Reasons: 1. The lubricant, which contains caustic, is in a sealed container. 2. Atomization and velocity of the sprayed material insure the coating of all die surfaces. 3. Use of a spray gun extension keeps the operator's body out of the machine. 4. Spraying is many times faster than hand lubrication. 5. Lubricant savings of 50 per cent are possible. 6. Rejects, due to scratching and scoring, are cut 30 to 50 per cent.

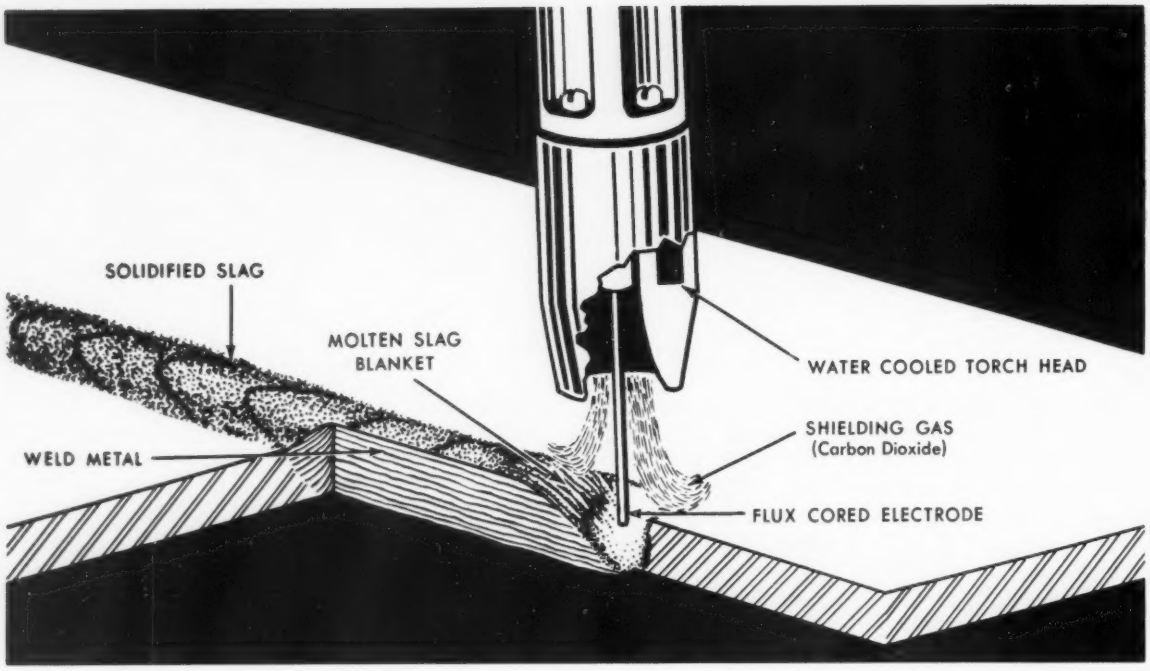
NEW ENGINE—White Motor Co., Cleveland, may be ready to launch a new, V-type diesel for trucks. Currently on road tests, the 2-cycle engine will be made in 4, 6 and 8-cylinder sizes up to 500 hp. Outstanding feature: All parts of the three engines, except the crankcase, will be interchangeable.

LESS NICKEL NEEDED— Working with Timken Roller Bearing Co., Canton, O., Eaton Mfg. Co., Cleveland, developed a better steel for gears (4717M) that uses 70 per cent less nickel than 4817, the material it replaced. Development followed the traditional pattern of shifting to higher manganese and molybdenum content.

PEEP SIGHT— A new pinhole detector for strip steel is capable of detecting holes measuring 0.01 in. while the strip flies past at 2000 fpm. The General Electric unit uses only six photomultiplier tubes, an unusually small number for this type equipment.

COATING TEST— The thickness of anodized coatings on aluminum may be checked automatically with the Rohco Anodicator, which conforms to ASTM B110-45. Based on the dielectric principle, it was developed by R. O. Hull & Co., Rocky River, O.

Metalworking Outlook—p. 45 *Market Outlook—p. 133*



New Flux-CO_2 Shield Improves Welds

Semiautomatic system features cored electrode and light gun. Manufacturer claims his equipment will buttweld ¼-in. mild steel at speeds in excess of 30 inches per minute

NATIONAL Cylinder Gas Co., the Chicago welding equipment maker, is the latest to combine the advantages of a gas and a flux to shield weld metal.

Its process, Dual Shield, was demonstrated at the recent welding show in Philadelphia. Here are some of its advantages:

The system deposits 14½-lb of weld metal an hour.

Ordinary accumulations of rust or scale on steel don't have to be removed prior to welding.

A novice can be trained to use the equipment in one day.

The arc and weld are visible at all times.

Equipment—The initial investment, $2300, buys a welding gun, electronic control unit, transformer, spool electrode and the gas supply plus a training course for an operator. The pistol grip gun weighs only 1½-lb, reducing operator fatigue. The electrode wire has a core which holds the flux. It comes in five sizes (1/16 to 3/16-in.).

The flux not only protects the weld from atmospheric contamination, it also contains an ionizer to stabilize the arc, a deoxidizer to reduce mill scale and a slag-forming agent.

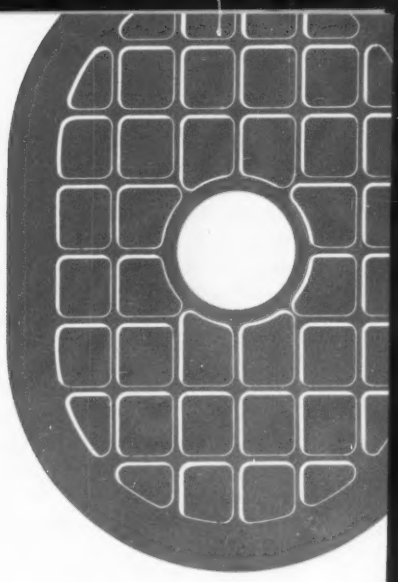
Carbon dioxide excludes air from the arc and molten metal and introduces a measured amount of oxygen into the weld pool. The oxygen combines with some of the flux compounds to clean and purify the weld metal.

The result, says Norman S. Strandwitz, head of NCG welding apparatus and electrode sales, is a stable arc that is at least 1000°F hotter than average (9000°F).

Tests—Lewis Welding & Engineering Corp., Cleveland, is one of several firms that have conducted field tests on Dual Shield. Glenn Johnson, plant manager, has this to say: "We're pretty well satisfied with the system. We've found that it will weld slightly out of position (30 degrees or less). Results are encouraging."

Design—NCG says that Dual Shield works best on single pass, horizontal and flat welding of mild steels 3/32 to ½-in. thick. It is especially helpful for small circular welds in shapes that won't hold powdered fluxes.

As demonstrated at Philadelphia, the arc is smooth and produces little spatter or smoke. Penetration is good. The finished weld appearance is even, and cross sections displayed were dense and free of porosity.



Chemical milling is an important production tool for plane and missile parts and is ready to move into other industries. It can make parts which are next to impossible with conventional machining

production ideas
NO. 11 OF A SERIES

Contouring with Chemicals

"CAN YOU make us some parts like this?" asked the aircraft engineer.

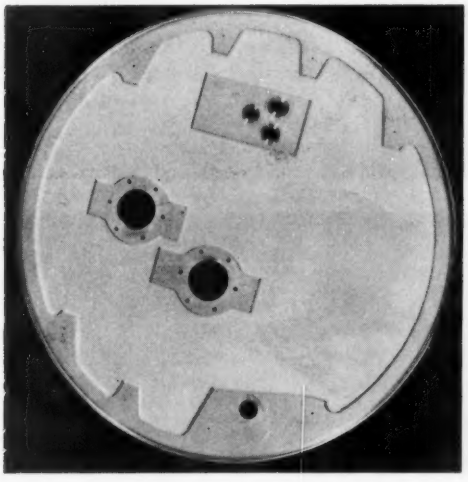
"Impossible!" was the reply of the machine shop operator. "But how did you make this one?" he asked, as he examined the intricate curves, bends and shaped islands of the one-piece aluminum part.

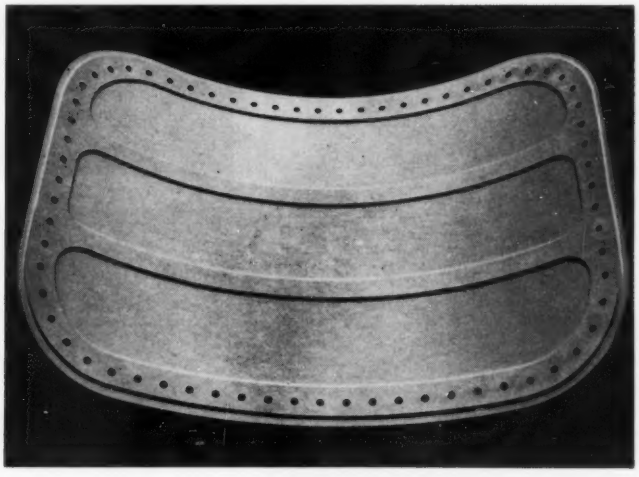
It was made in the laboratory at North American Aviation Inc., Downey, Calif., by chemical milling—a process for metal removal invented by Manuel Sanz, materials research and process group leader.

Catching On—A lot has happened since that incident took place about three years ago. Some 40 companies are now licensed to produce parts by chemical milling. Although applications are almost entirely in the aircraft and missile fields (where it's growing at a phenomenal rate), it has vast potential in other industries.

The automotive industry is taking a serious look at it—rumor has it that one large auto maker is negotiating a license.

Targets—Those making parts for aircraft use are quick to point





The fuel tank bulkhead above was fabricated by Northrup Aircraft from a 3/16-in. aluminum plate. Depth of cut is 0.360-in., leaving a web 0.060 in. thick. Chemical milling was used to avoid warping and because it was cheaper than machine milling in this case: The removal of metal to a shallow depth over large areas. The titanium part (above) was chemical milled by Convair without deleterious hydrogen pickup

out these potential applications in other areas:

• Architectural: Aluminum panels can be given unusual configurations and sculptured effects, then anodized and selectively colored.

• Automotive: Possible decorative uses (grilles and dashboard panels, for example) are many. Chemical milled cylinder heads could help raise engine compression ratios. The fact that you can produce tapered parts inexpensively opens up a lot of possibilities.

• Tooling: The cost of making stamping and other dies could be reduced. Some manufacturers are thinking about chemical milling prototype forgings to minimize investment in precision dies.

The manufacturing advantages found in making plane parts also go across the board: Highly skilled operators are not required. The method lends itself to automatic processing. The number of parts that can be processed at one time is limited only by the size of the etching tank.

What It Is—Chemicals are used to remove (deep etch) metal. The amount removed (depth of cut) is controlled by the time of immersion. Areas that are not milled are protected by masking.

The process is being used to make aluminum, titanium, magnesium, alloy and stainless steel parts. Aluminum alloys (sheets, plates, extrusions and forgings) are handled on a production basis. So are several steels—17-7 PH, 300 and 400 series stainless and alloy grades such as 4130 and 4340. Titanium alloys are entering the picture in increasing volume.

The process will be extended to other metals and special alloys when solutions are developed to dissolve them.

Specs — Practical maximum depth of cut appears to be about 0.25 in., although some users go up to 0.50 in. With deeper cuts, gas is trapped beneath the mask and is not displaced by solution agitation, which results in uneven etching in these areas. But the problem is not insurmountable.

Chemical attack is uniform from any point of the exposed or unmasked area. This gives a radius at the edge equal to the depth of metal removed. The minimum width of cut must be twice the depth.

Examples—Photographs at the bottom of pages 85 and 86 show typical parts. They illustrate reasons for the fast growth of the process.

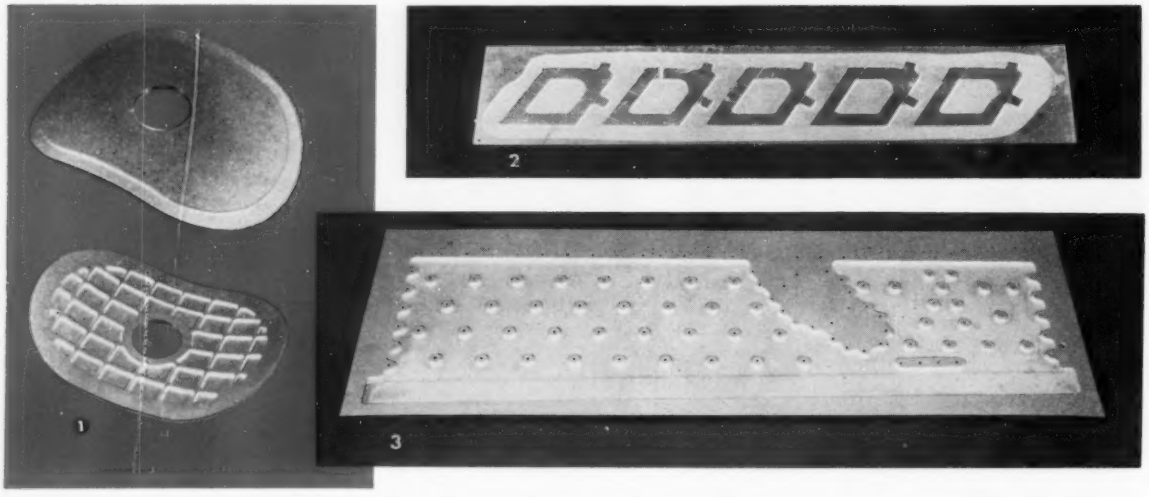
"The fact that the designer is no longer limited to machine practicality is the most important advantage," says Hugh H. Muller, former engineer with Northrop Aircraft Inc., Hawthorne, Calif. Mr. Muller recently joined the Chem-Mill Division of Turco Products Inc., Los Angeles. Through arrangements with North American Aviation, it is licensed to make the process known by its proprietary name, "Chem-Mill," available to industry.

Parts may be formed or contoured prior to milling, one of the big reasons for the rapid rise in the use of the process as a manufacturing method, Mr. Muller says.

Simplicity—Commenting on outlook for the process at Convair Division, General Dynamics Corp., San Diego, Calif., C. L. Hibert, senior design engineer had this to say: "Complex engineering designs are executed by simple production facilities and a technique which features tanks, solutions, masking and unskilled labor. The point is this: Simplification means less cost as well as weight."

Hardness of the metal does not affect its removal rate, a bright ray of hope as designers move toward aircraft of alloy steel construction. Comments Mr. Hibert: "I visualize the aircraft of the future as being fabricated of sheet metal weldments, chemically milled in detail."

Production and design people view chemical milling and conventional machining as complementary, not rival methods. Each has its advantages and disadvantages which should be evaluated when the part is being designed.



1. This part is made from a ½-in. plate. Curvature is obtained by roll forming before chemical milling. 2. These five small parts are chemical milled as a unit, later cut and trimmed to proper size. 3. Great accuracy and detail are achieved in the chemical milling of this part at North American Aviation Inc.

Nine Advantages of Chemical Milling That Influence Design

Areas that are to be etched are scribed, using a template as a guide. The mask is hand stripped

- **1. Milling after forming or contouring**—Simpler forming dies mean lower costs.
- **2. Fewer problems**—Complicated patterns that might restrict cutter size, shape or direction of cut are no problem. Broad or narrow cuts and sharp corners are possible in one operation.
- **3. Both sides at once**—Complex contoured or formed parts may be milled on both sides simultaneously. This avoids warpage which might result from machining in separate operations.
- **4. Lighter construction**—You can cut closely controlled, complicated shapes at low cost, so you may be able to design integrally stiffened panels without riveted or welded doublers. Manufacturing steps are reduced; less detail drafting is needed. The weight of parts made from extrusions, forgings or deep drawn sections may be reduced. Standard sizes and minimum thicknesses required for forming sometimes make for excess weight.
- **5. Closer tolerances**—Sheet thickness can be held to tolerances of ± 0.002 in., compared with about ± 0.010 in. for machine milling. Convair follows these rules:

Depth of Etch	Tolerances
Up to 0.030 in.	± 0.002 in.
0.031 to 0.060 in.	± 0.0025 in.
0.61 to 0.090 in.	± 0.003 in.
Over 0.091 in.	± 0.004 in.

- **6. Tapering**—Parts may be tapered by gradual immersion or removal from the tank. A thickness as low as 0.002 in. can be made with excellent uniformity.
- **7. Multiple depths of cut on one sheet**—This is done by progressive unmasking.
- **8. No finishing**—Parts generally require no finishing, such as sanding or polishing.
- **9. Facilitates change**—Tooling is simple and cheap. It's easily altered, eliminating delays when design changes are made.

Economics—They will also tell you that cost comparisons with conventional machining for any one part can be misleading. L. G. Hall, supervisor, engineering department, North American Aviation Inc., told the Society of Automotive Engineers recently that chemical milling can claim these cost advantages: 1. Labor rates are lower. 2. Tooling requirements are insignificant. 3. Investment in capital equipment is less. 4. Bringing detailed parts into one-piece design can save in engineering, planning, tooling and manufacturing.

Aircraft partmakers emphasize that the process must be considered in the design stage to get full advantage from it. They point out that engineers think in terms of designs within the limits of machine cutting.

The check list (left) shows the advantages designers see in the process. They indicate many areas in which partmaking can be simplified and how the unusual can be done.

Special Problems — Chemical millers also predict that the process will solve a lot of manufacturing problems once industry learns more about it.

Convair has a case in point: The production of undersize screwthreads on aluminum parts to allow for the thickness of metal added by plating. Machining is expensive and scrap loss is high.

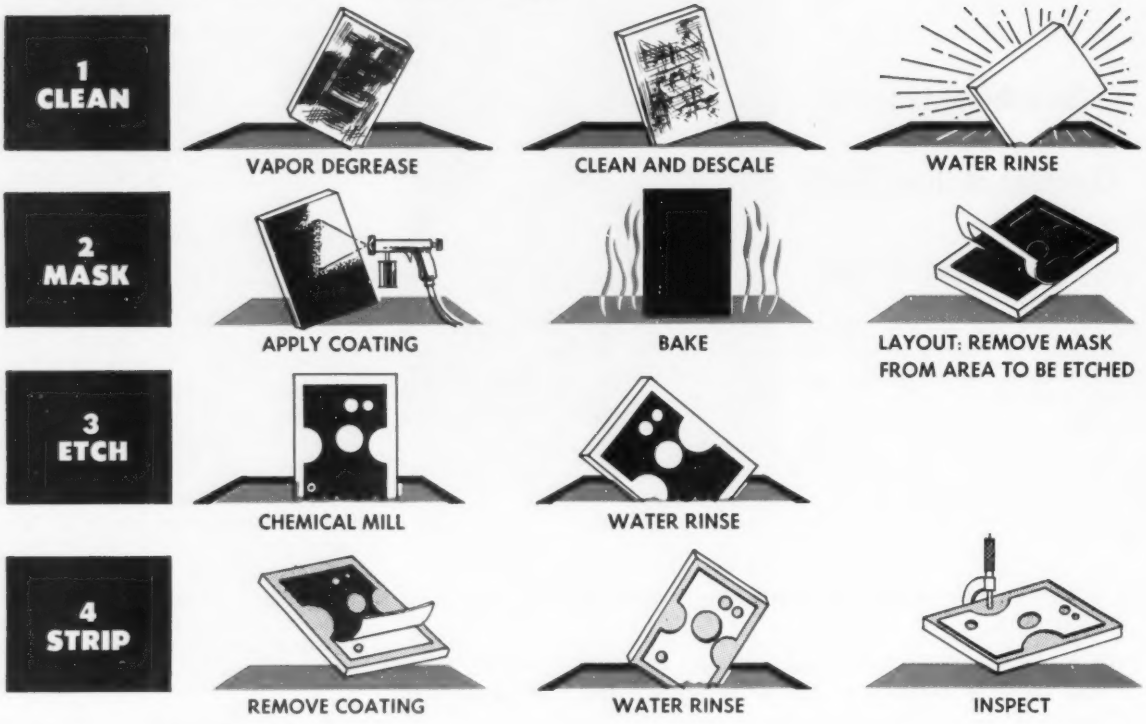
Now all parts are machined to final dimension over-all. The threads are reduced to correct preplating dimensions by chemical milling. The aluminum parts are placed in a tumbling barrel, containing dilute etchant at room temperature. Metal equal to the required plating thickness is removed.

Process—The basic steps are the same for any metal: 1. Cleaning. 2. Masking. 3. Etching. 4. Demasking. The procedures are illustrated in the diagram at the top of page 88.

Cleaning must be thorough to insure uniform adhesion of the maskant and uniform chemical dissolution of the metal. Special pains must be taken to be sure lubricant is removed when cleaning formed or forged parts.

Northrop Aircraft uses this cleaning cycle for all parts: Vapor

Basic Steps Are the Same for Any Metal:



degrease, hot mild alkali cleaner, rinse, mild acid treatment, rinse and dry. Steel and titanium are descaled before cleaning.

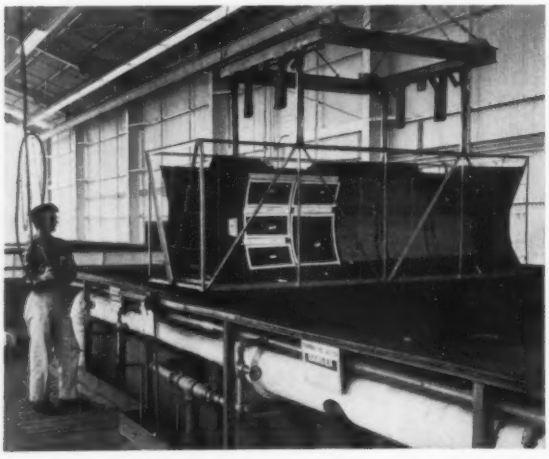
Masking—The clean, dry parts are either dip or spray coated, depending on their size. Suitable maskants have been developed for both hot alkaline solutions and strong hot oxidizing acid solutions. Some parts are processed for overall reduction of dimensions or are tapered. For those operations, no maskant is required.

Areas to be etched are scribed, using a template as a guide. The maskant is removed from these areas by hand stripping.

Etching—Parts, in a basket or fastened in a rack, are immersed in the etchant tank. Rate of metal removal is about 0.001 in. per minute.

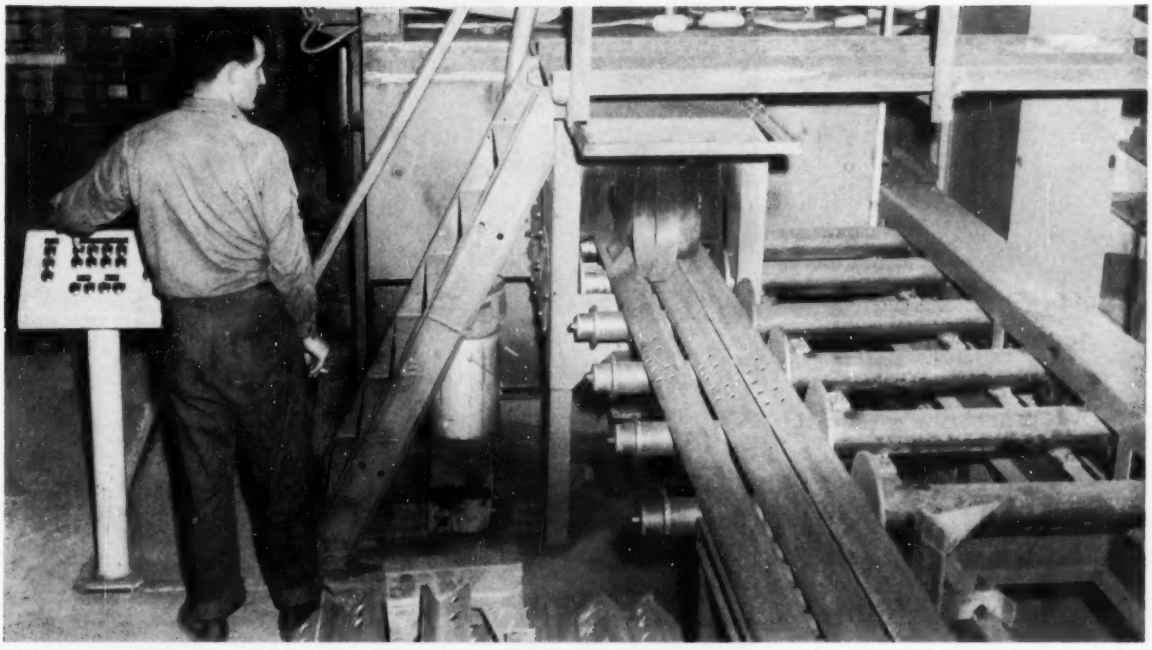
Modified caustic solutions are generally used for aluminum. But North American Aviation's Columbus, O., plant is using hydrochloric acid as a production etchant for aluminum. Acid solutions are used for the more etch resistant metals —such as stainless, alloy steels and titanium.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, *Penton Bldg., Cleveland 13, O.*



A load of stainless steel parts ready for the etch tank

This part comes out for checking after etching



Roller conveyor carries long structurals through the blast descaler. It uses heat treated cast steel to reduce dross loss

Blast Descales Structurals

Here is how a Canadian firm eliminated a lot of acid pickling prior to galvanizing. Preparation time has been cut 75 per cent. Production is three times faster than it was

The near structural part is untreated. The middle one has been blast descaled. The other is galvanized

STRUCTURAL steel members are being hot dip galvanized on a production basis with practically no acid pickling at Provincial Engineering Co., Niagara Falls, Ont. The company descales mechanically with airless abrasive blasting.

Method — Two machines are used. One, for the long structurals, carries the pieces through the blast on rollers. The shot particles are hurled centrifugally from four-bladed wheels inside the cabinet. Two are above and two below the pass line of the structurals. Work is entirely cleaned in one pass.

The second machine, for smaller parts, employs a tumbling action with the blast. It has one shot hurling wheel and a batch-type cleaning chamber with a capacity of 11½-cu ft. That size, plus tumbling, which exposes all parts to the blast, permits many medium and small parts to be cleaned at one time.

Both machines were designed by Wheelabrator Corp., Mishawaka, Ind.

Advantages—Parts are cleaned with this method more quickly, the firm says. Preparation time was cut from 50 minutes to only 7 (plus time for a token pickling). Production has increased 2.5 to 3 times over what it was.

Here are some of the other advantages cited:

- Manpower requirements are reduced. Structurals used to be put on one rack for the acid dip and on another for galvanizing—a double handling.
- Dross loss is reduced because heat treated cast shot is used. It creates almost no contaminating iron dust.
- A 3-minute pickle, which comes later, reduces dross loss even more. Steel need not be re-racked, and this step takes advantage of the waiting period while the rack already in the galvanizing kettle is removed.

Improved Quality—The new process reduced rejects from about 10 per cent to almost nothing. It cut the number of pieces which needed a second cleaning. The reduction in handling and processing time helped increased production. Working conditons are much better.

Especially effective in field use, this instrument is sensitive to both yield and tensile strengths. No surface preparation is required for inspection

Checking plates for strength. Standard jaws will test metal ⅛ to ¾-in. thick. Special jaws are available for other sizes and shapes

Hardness Tool Checks Specs

Depth of tiny circular impression is checked with direct reading indicator

A NEW portable inspection tool quickly answers the question: "Does this material meet specifications?"

Known as the Henrikson Hardness Monitor, it's sensitive to both yield and tensile strength of the material. No surface preparation is required; it's effective over paint, rust or decarb, claims its inventor, Karl Henrikson, a Cedar Rapids, Iowa, metallurgist.

Accuracy — It will differentiate between low alloy, high strength steel with a probable yield of 52,000 psi and ultimate of 75,000 psi and ASTM-7 structural steel which has a probable yield of 40,000 psi and an ultimate of 63,000 psi.

"In the new instrument," says Mr. Henrikson, "I have, in effect, taken a small portion of the Brinell scale and magnified it. Operation is simple. Pressure to operate the penetrator is applied by a hydraulic hand pump. The depth of the tiny circular impression is checked with a direct reading indicator."

One Case—A heavy equipment maker checks his Cor-Ten steel chord angles with the Monitor at 4500 lb pressure. An acceptable angle has an impression depth of 0.009 to 0.013 in. Angles rolled from A-7 structural steel sometimes are found mixed in shipment and can readily be detected because they have impression depths of 0.030 to 0.045 in.

Especially effective in field use, it can be carried easily—it weighs less than 20 lb.

The tester also will separate the various aluminum alloys and cast irons. Results on cast iron are affected by both Brinell hardness and percentage of pearlite.

PowerGrip "TIMING" BELTS

"Here's how this hobbing machine was made 37% more productive"

says Plant Engineer "GRIP" POWERS

Schematic of an imported Precision Gear Hobber, used to cut Naval Bronze Worm Wheels for gear head motors. Prior to the installation of U. S. PowerGrip "Timing"® Belts on the main drive motor (A), belt slippage—on three ordinary belts—kept daily production to 40 wheels per day. Now with just one Heavy-Duty PowerGrip "Timing" Belt (TB), there is no slippage—even under high loads and exposure to oils used in cutting gems—and they're getting 55 wheels per day without any further labor or equipment involved. That means considerable savings over a run of 2000 wheels.

"Grip" Powers is showing you a true story of how one East Coast gear manufacturer utilized the unique ability of U. S. PowerGrip "Timing" Belts to step up production. It's just one of many examples of how U. S. PowerGrip "Timing" Belts simplify and improve a power transmission unit.

For the design of hand tools, drill presses, saws, electric typewriters—from fleapower to 1,000 horsepower—get U.S. PowerGrip "Timing" Belts.

These belts—plus expert engineering service—are obtainable at the 28 "U. S." District Sales Offices, "U. S." power transmission distributors, or contact us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.

U. S. PowerGrip "Timing" Belts offer all these advantages:

- close to 100% efficiency.
- constant angular velocity.
- imbedded with steel cables for high tensile strength.
- no slippage, no take-up—allows short centers, high ratios.
- absence of metal-to-metal contact—eliminates need for lubrication and housing devices.
- handles speeds up to 16,000 F.P.M. or so slow as to be imperceptible to the eye.

Mechanical Goods Division

United States Rubber

Steelmaking with Oxygen in the Open Hearth

With no external heat source, the Inland oxygen process can . . .

1. Produce 0.010 per cent phosphorus steel from pig iron containing 0.7 per cent phosphorus.
2. Make high carbon, low phosphorus steel without large amounts of recarburizers.
3. Produce steel with less than 0.005 nitrogen.
4. Produce compositions identical to basic open hearth steels.
5. Produce low sulphur steel from most American pig irons.

Oxygen Conversion in the Open Hearth

Four commercial size heats of carbon steel, refined in the open hearth by oxygen lance, point the way to changes in the design of oxygen converter vessels

WITH OXYGEN, and no external heat, quality carbon steel has been made in an open hearth furnace at Inland Steel Co., East Chicago, Ind.

The method is simple. Dampers were opened to let waste gases escape through both checkers, and oxygen was poured in at the slag-metal interface by lances inserted through three doors. Heat time, charging to tap, averaged 3.39 hours for four 125-ton heats.

Evolution—The company is not using the process commercially. ("There's not enough oxygen available for the present open hearths.") But it has shown what can be done. For one thing, the experiment could strongly influence the design of oxygen steelmaking vessels.

Ever since the L-D converter became commercial, a trend away from the bessemer type vessel has been predicted. The Inland experiment swings to the opposite extreme of the shallow pan-shaped reactor. It creates the suspicion that rotating the vessel (as in the Kal-Do and Rotorstahl processes) may be an unnecessarily complex way to get optimum reaction surface. Perhaps its most attractive feature is that it utilizes the furnace which is the backbone of American steelmaking.

Converter — Although the experiment ended with the open hearth, it began with an old side-blown acid converter. Tuyeres were removed and an 11 in. square door cut into the 36 in. diameter shell. A new lining of low-iron basic brick over a 1 in. layer of plastic chrome refractory created a reaction chamber 16 in. in diameter and 15½-in. deep.

The standard charge for this furnace: Hot metal, about 750 lb; limestone and sinter ore, 45 lb each; scrap, 25 lb. Hot metal was charged on top of the solids, starting an active boil. Oxygen was fed to the bath by lance, and a hot liquid slag formed.

When 8 to 10 in. of foamy slag covered the metal surface, it was flushed out the door by tilting the vessel. After flushing, a new slag was built up with burnt lime and fluorspar additions. The furnace was tapped when the right carbon content and temperature were reached.

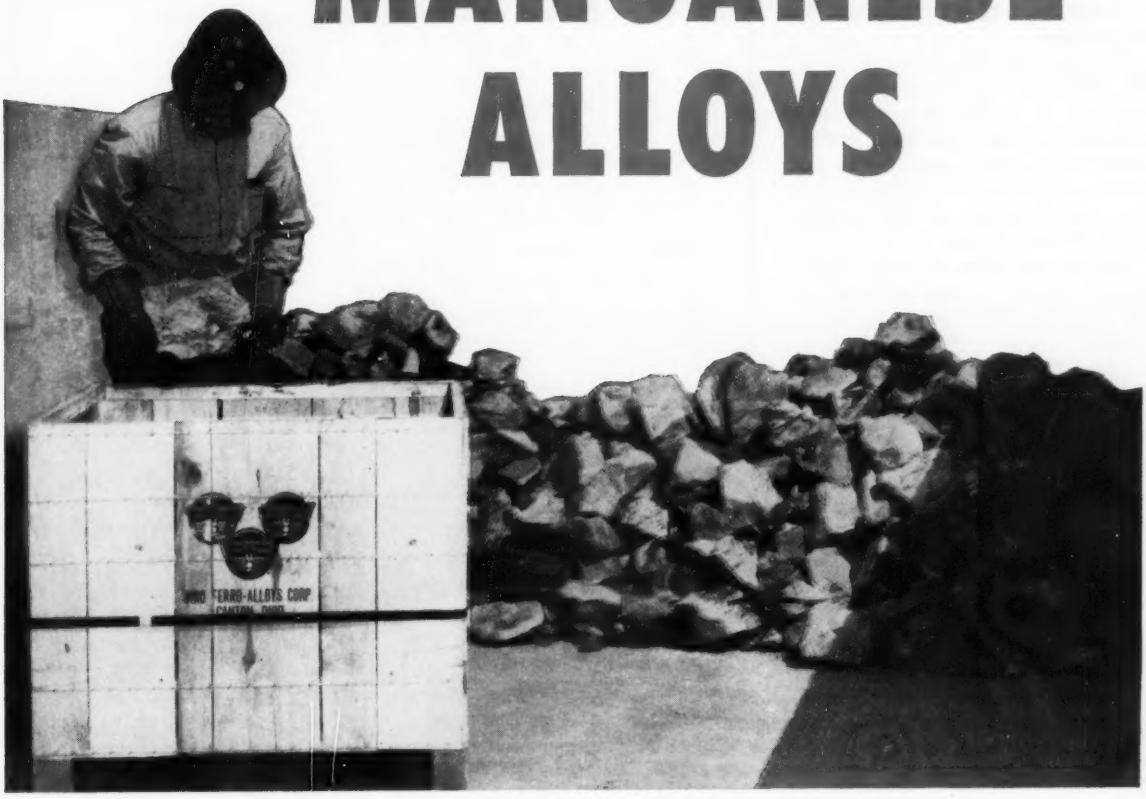
Advantages — The distinctive feature of the process is the rapid elimination of phosphorus in the first flush slag. Six heats averaging 0.690 per cent phosphorus in the hot metal showed 0.190 per cent phosphorus after the first flush slag and 0.010 per cent phosphorus in the final product.

Ability to remove sulphur went along with phosphorus elimination. Between 53 and 64 per cent of the initial sulphur in 28 heats was removed during refining. Bath samples from all 61 heats and seven ingot samples showed extremely low nitrogen (from a trace to 0.003 per cent), a benefit from the 99.5 per cent pure oxygen used.

The experiments in the 750-lb basic lined vessel showed that the process is capable of producing steels at any desired carbon level without recarburization. They are low in sulphur, phosphorus and nitrogen.

Open Hearth — Encouraged by results, Inland decided to give the process a commercial try. A 175-

MANGANESE ALLOYS



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- 74 - 76% Manganese
- 78 - 82% Manganese

MEDIUM CARBON FERROMANGANESE

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2. 00% Max. Carbon Grade
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SILICOMANGANESE BRIQUETS

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ton open hearth in its No. 2 Open Hearth Shop was selected. The expectation was that the hearth type furnace might be beneficial to the process.

Two modifications were made to the furnace. The flush hole was dropped to a 125-ton heat level, and the opening was enlarged to permit rapid slag runoff. Holes for three oxygen lances were cut above the wicket holes in the middle three furnace doors.

Before charging, regular burners were used to heat the furnace to simulate the conditions after tapping a heat. Then the fuel was turned off. Dampers were opened to let waste gases escape through both regenerators.

Heat—The cold charge went in first. Lancing with 95 per cent oxygen started immediately after the hot metal addition. It was poured in at the slag-metal interface at the highest rate possible and was injected continuously through to tap. Most of the time two lances were used, the third being out for changing.

Up to 35 per cent of the phosphorus and 50 per cent of the manganese were removed in the flush, which began a few minutes after oxygen was fed to the bath. The final phosphorus, sulphur, nitrogen and manganese levels were well within the normal open hearth range.

Oxygen—On the first two heats, the bath showed some tendency to freeze out around the edges and supplemental heat was needed. When the blowing rate was pushed to 1980 cfm, the heat remained fully molten and tapped out at 3025°F. This is a blowing rate less than that used on oxygen converter heats of half the size and good evidence that given enough oxygen the process requires no supplementary fuel.

Refining times ran from 20 minutes to 3 hours; a 1½-hour refining time would probably be close to optimum. The lances used were 1 in. diameter pipes—nothing fancy. One Inland engineer suggests that flooding the atmosphere above the bath with oxygen might be a perfectly satisfactory method of introducing it.

Drawbacks — While the process is capable of doing what the box at top of page 92 says, it is not without deficiencies, and there are many unknowns. The dense cloud of iron oxide thrown up above the bath looks bad for refractories in the roof, but probably creates no more of a dust problem than any other converter does.

Effect of such large quantities of oxygen on refractories in the bottom and walls remains in question. (The furnace used was old and ready to go down for rebuild.) There was some bottom erosion and cutting out on the backwall.

Where Now?—Inland investigators feel that the open hearth is not the ideal bath shape for the process. A tilting hearth, they point out, would aid slagging, but it would still be an open hearth.

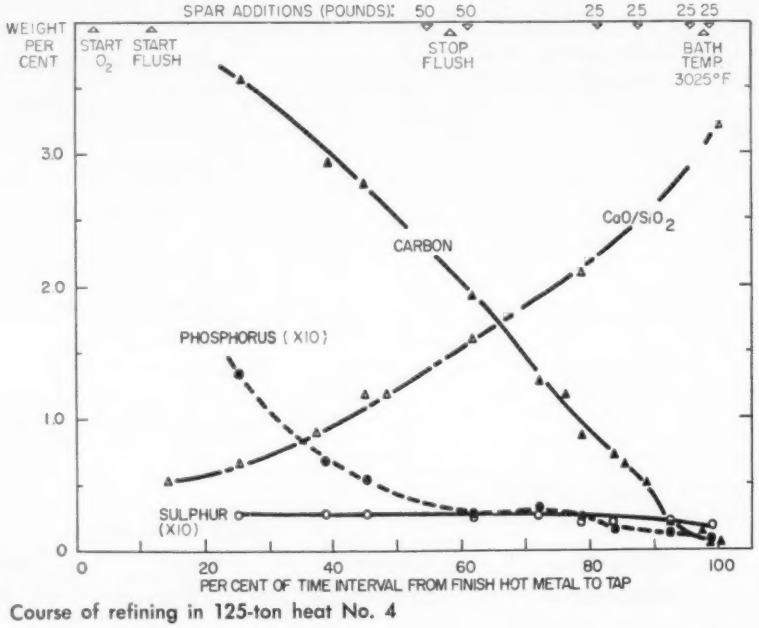
Since the process divorces the hearth from its costly checkers and flues, it seems logical to expect the next trials on a large scale to be made in a vessel designed specifically for the process. Meanwhile, small scale work is being carried on at Armour Research Foundation of Illinois Institute of Technology, Chicago.

Production Data, 125-Ton Heat No. 4

(Refined with oxygen and no external heat)

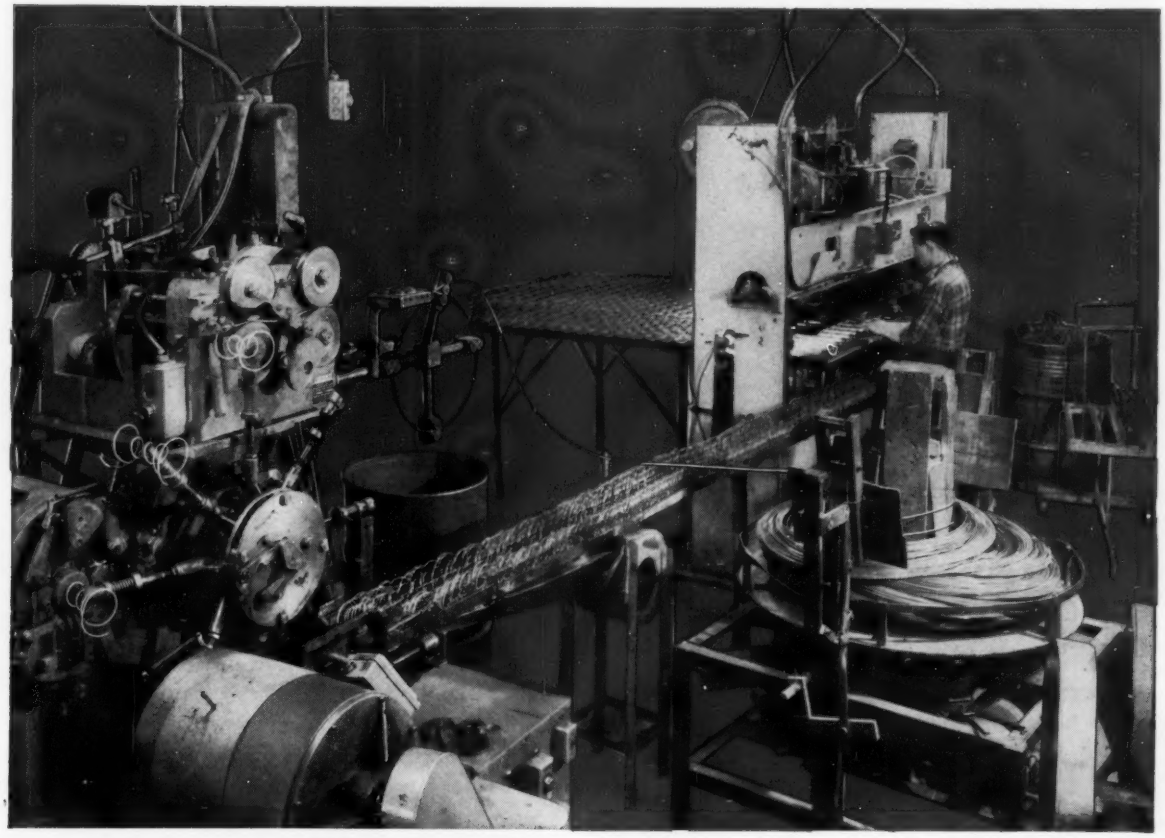
Charge:

Limestone	19,500 lb
Sinter	17,000 lb
Burnt lime	3,600 lb
Scrap	9,600 lb
Hot metal	245,000 lb
Heat time, charge to tap	2.83 hr
Productivity, tons per hr	40.1
Oxygen consumption cu ft per ton	2100
Oxygen efficiency	98.6 per cent
Production, ingots	113.4 tons
Ingot yield	86.0 per cent
Oxygen blowing rate	1980 cfm
Carbon drop, points per minute	3.41



Course of refining in 125-ton heat No. 4

Double cone springs are produced automatically on this Wunderlich special high speed automatic coiling and knotting machine at the Sealy Mattress Company, Cleveland, Ohio. Machine coils, crimps, knots and heat treats springs made from 13½ gage Mastercraft spring wire, supplied in 600 lb. bundles.



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J&L spring wire reduces number of rejects, increases production, in modern automatic operations. One reason is that every bundle of spring wire is produced to closely controlled tolerances.

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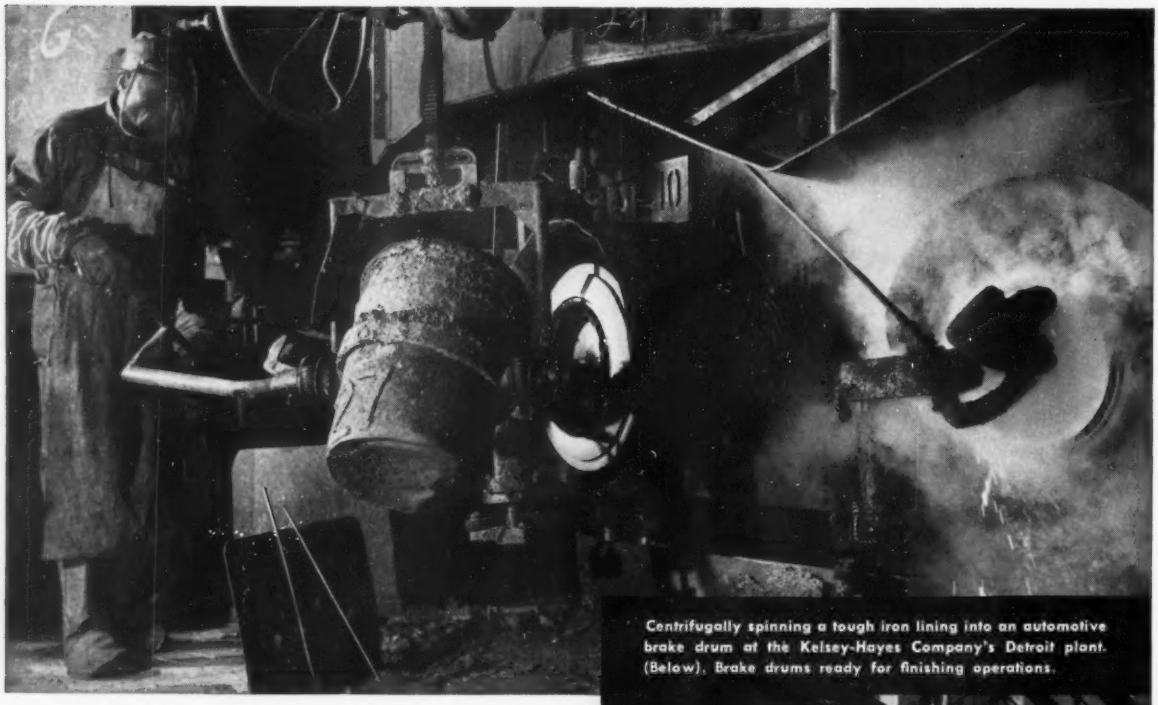

Centrifugally spinning a tough iron lining into an automotive brake drum at the Kelsey-Hayes Company's Detroit plant. (Below). Brake drums ready for finishing operations.

Kelsey-Hayes casts longer wearing brake drums with Hanna pig iron

Kelsey-Hayes is a key supplier to the auto industry. One of its leading products is a brake drum with a centrifugally spun iron lining. Kelsey-Hayes also produces thousands of sand cast brake drums. Strict uniformity of each melt is of major importance to Kelsey-Hayes.

To maintain their high standards, Kelsey-Hayes uses thousands of tons of Hanna Malleable Pig Iron annually.

Kelsey-Hayes, like the many other Hanna customers, knows that for pig iron of high metallurgical quality and analysis, it can always depend on Hanna.

Hanna makes all regular grades of pig iron, as well as HannaTite and Hanna Silvery, available in two sizes—the 38-pound pig and the 10-pound HannaTen ingot. Hanna qualities contribute to the production of denser, stronger castings with uniform machining qualities. These features are particularly beneficial in HannaTite—a specially made iron, possessing extra-fine grain structure with smaller, uniformly distributed graphite flakes.

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THE BEST KNOWN NAME IN IRON

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Flexible Tooling Unit

Output has more than tripled since turret attachment has been added to shop

A SMALL job shop, Ray Johnson Associates, Greenwich, Conn., is doing production and experimental work on the same machinery.

How: It coupled a Howe & Fant turret drilling attachment to a Bridgeport miller.

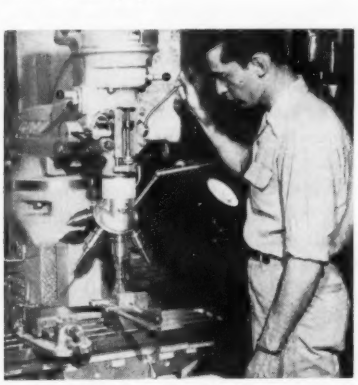
The shop makes precision parts for Microphase Corp., developer and manufacturer of VHF and microwave filters for aircraft electronic systems. Its program calls for the manufacture of as few as ten parts on an experimental basis. After design approval, a run of 300 to 900 units is required.

The attachment makes both operations profitable. With it, the miller is capable of drilling, reaming, tapping and counterboring a hole without removing the work from the fixture.

Aluminum parts often have six or more holes in a straight line with as many different diameters. Space tolerances must be held to plus or minus 0.001 in. from hole center to hole center.

With the attachment, the six stations on the turret head enable the operator to line up the work under the spindle and keep it there until all operations on one hole have been completed. Output has been tripled.

Accuracy of the alignment of the work and spindle and the rigidity afforded by the workholding fixture do away with a need for special jigs. If jigs were required, the firm points out, neither operation would pay.



Drills, reamers, taps or counterbores are changed with a flick of the wrist

Throwaway Cutters Boost Speed

With no tip strains resulting from brazing, operators can go to harder grades. The disposables may help solve the dilemma of trying to cut the high alloys

THROWAWAY insert cutting tools may have advantages some metalworking production men haven't even counted on. Engineers at Convair, a division of General Dynamics Corp., San Diego, Calif., report the throwaways are giving them better performance at higher speeds and feeds than they got with brazed tips.

W. L. Carr, an assistant foreman at Convair, credits the absence of brazing strains for the improved performance.

"Actually," he says, "the lack of these strains in the insert-type tools enables the operator to use harder grades of carbide which will give the needed performance at higher surface speeds."

High Alloys—Speed abilities of the disposables may be an aid in machining some of the difficult alloys aircraft builders deal with. Mr. Carr reports that materials like SAE 4130 with a tensile strength of 145,000 psi are constantly machined at 600 to 800 sfpm. Materials in the 150,000 through 220,000 psi tensile range are machined at 450 to 600 sfpm.

Education—Before starting to use the throwaways, production men called in the machine operators and setup men—showed them what the tools were and how they could best be handled. Each operator got a set of speed and feed charts that also told what grades of carbide were in stock and what grades should be used on any given material.

All insert tips for single point tools are color coded for easy identification of different grades. On parts for the supersonic F-102A interceptor, all turning and facing operations are done with throwaways. So are about 60 per cent of the face milling jobs.

In a survey covering 352 manhours, 90 tips were used to turn and face 37,500 parts. Tool cost was about $90.

Convair engineers now are going to these tools for side milling. The cutters are being made in 6, 8 and 10 in. diameters. Mr. Carr says they will use the same principle of design as the face milling and single point types.

Tape Standard?

Potential users of numerically controlled contouring machines are looking for a point of compatibility in competitive systems. Best guess now is that they will decide on 1-in. punched paper tape as the primary information storage medium.

A contouring committee of the Radio, Electronics & Television Manufacturers' Association already has reached a preliminary agreement on this point. It probably will coincide closely with requests to come from the aircraft industry.

Aircraft builders point up the need for compatibility: They want to be able to hand out pre-established machine programs (taped) to any of several subcontractors without going through expensive information altering stages. A decision to use the 1-in. paper tape won't cause headaches for any of the machine builders. Although the standard won't be mandatory, most builders will feature systems adhering to it. Two of the major contouring systems (Bendix and GE) already use this tape for primary information storage. A third system (Cincinnati Milling Machine Co.), uses punched cards, but the information can easily be converted to tape.

Inoculants Change Properties of Gray Iron

	Composition C%	Si%	Addition in %	Transverse Breaking Load in pounds	Deflection in inches	Tensile Strength in psi	Chill Depth* in 1/32-in.
SILICON ADDITIONS	2.95	2.00	0.30 Si as FeSi	2665	0.208	46,910	30-45
	2.94	1.95	0.35 Si as CaSi	3597	0.361	58,750	13-18
	2.90	2.17	0.60 Si as FeSi	2905	0.261	51,470	12-20
	2.84	2.21	0.70 Si as CaSi	3728	0.394	59,200	4-8
CALCIUM ADDITIONS	2.72	2.46	1.00 Ca	3313	0.313		2-3
	2.73	2.48	0.75 Ca	3389	0.341		4-6
	2.70	2.43	0.10 Ca	3245	0.292		5-12
	2.74	2.47	none	2390	0.191		12-28
ALUMINUM ADDITIONS	2.82	2.26	0.50 Al	2450	0.194		2-8
	2.84	2.28	0.07 Al	2465	0.211		11-30
	2.84	2.33	none	2478	0.212		8-31

*Clear chill and total chill.

Improved Metals for Castings

Calcium additions improve gray iron . . . New steel resists brittle fracture . . . Chemical analysis is cause of galvanizing embrittlement . . . Copper alloy beats corrosion

THE CHART above shows how better gray iron castings can be made. It is just one example of advances revealed at the First Engineered Castings Show of the American Foundrymen's Society in Cincinnati.

How Good?—The effectiveness of silicon alloys and active metals in the inoculation of gray iron was explained by H. L. Womochel, Michigan State University, East Lansing, Mich. His research team found calcium-silicon to be superior to ferrosilicon when additions were made to produce the same silicon increase (see chart). Mechanical properties were superior, and depth of chill was less.

Microstructures of traverse bars show type A graphite distribution in the interior of bars treated with the heavy addition of calcium-silicon. Corresponding bars treated with ferrosilicon show a tendency to D and E graphite distribution.

The investigators say it appears advisable to use calcium-silicon more than has been the practice in electric furnace production of high strength irons. Another conclusion: "Larger than usual additions of inoculants are required when a maximum of mechanical properties with minimum chilling tendency is desired."

More Tests — Alloys containing silicon, manganese and zirconium were compared with calcium-silicon. Results indicate that the zirconium combination is inferior to CaSi in mechanical properties but slightly better in reducing chill.

Other tests suggest that silicon has no value as an inoculant. In fact, they indicate that adding it late may be slightly detrimental.

Excellent properties and structures were shown by irons treated with pure calcium (see chart). The microstructures were comparable to those of calcium-silicon treated irons. Practically all graphite at the casting surface was type A.

Irons made with additions of aluminum exhibited little change in mechanical properties, but the effect of 0.50 per cent aluminum addition was marked (see chart).

The aluminum treated irons showed no improvements in their graphite distribution; however, they had larger amounts of ferrite associated with the type D graphite. The experimenters explain: "Apparently, aluminum is capable of reducing the chilling tendency and carbide stability without an improvement in graphite distribution." This suggests that a high chilling tendency is not necessarily accompanied by abnormal graphite distribution.

Better Steel—Tests on a grade B steel modified to contain 0.18

Universal collapsing tap parts of **MAX-EL** alloy steel finish machined after full heat treatment

Considerable machining is required in the manufacture of parts for these taps. That's why Crucible MAX-EL® 3½ free machining alloy steel was chosen by the Geometric Tool Company, Division of Greenfield Tap and Die Corporation. For with MAX-EL you can rough machine, *then* heat treat even intricate parts before final machining *with no danger of distortion of the steel.*

But the best way to check the advantages of MAX-EL is to try it in your own shop. Like many other users you'll appreciate its superior machinability, freedom from distortion, deep hardenability characteristics, uniformity and quality. And you'll like the longer tool life you get by using MAX-EL.

For complete data . . . and *quick delivery* of MAX-EL alloy steels, from local warehouse stocks, call *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

per cent carbon and 1.20 per cent manganese were made by R. D. Engquist, American Steel Foundries, East Chicago, Ind. (see chart at right).

Advantages to the users of the new alloy include: 1. Increased resistance to brittle fracture through improved impact characteristics and the reduced possibility of hot tears in castings. 2. More effective surface hardening of areas subject to wear. 3. Ready weldability for cast-weld fabrication.

Embrittlement — Additions of phosphorus and silicon to nodular and malleable iron increase the susceptibility to temper embrittlement, reported G. N. J. Gilbert of the British Cast Iron Research Association, Birmingham, England.

Ferritic nodular iron (cooled slowly from 1202°F) is embrittled when quenched from 842°F. Slow cooling from 842°F instead of quenching, Mr. Gilbert said, increased ductility during the cooling cycle. Molybdenum additions inhibit embrittlement.

R. W. Sandelin, Connors Steel Division, H. K. Porter Company Inc., Birmingham, Ala., says the cause and controlling factor of galvanizing embrittlement of malleable iron is found in its chemical composition. The second graph, right, shows that a high phosphorus content in a high silicon base iron will make it susceptible to embrittlement while the same phosphorus content in a low silicon iron has no detrimental effect.

Increasing the copper content will partially offset the ill effects of phosphorus.

Neither pickling nor the immersion in molten zinc, says Mr. Sandelin, are primary factors in causing embrittlement. Proof: Test bars heated in a furnace to 800-900°F showed embrittlement.

Fracture appearances correlate with impact test data and can be used to evaluate embrittlement. The fracture resulting from galvanizing embrittlement is intergranular and appears white instead of the dark and silky fracture of normal malleable iron.

New Alloy—A cupronickel casting alloy for corrosive marine service was described by G. L. Lee, Research Laboratory, International Nickel Co., Bayonne, N.J. The copper-based alloy has a tensile strength of 95,000 psi and contains 12 per cent nickel, 1.5 per cent aluminum, 1 per cent manganese and 0.6 per cent iron. It is deoxidized with 0.05 per cent each of phosphorus, titanium and calcium.

For pressure castings, wall thicknesses should be ¼-in. or more.

N. C. Howells and E. A. Lange of the Naval Research Laboratory, Washington, studied fracture characteristics of 15 Navy copper-base alloys. They found that the fracture characteristics of these alloys are different from those of steel. Copper-base alloys with Charpy V energy values of 3 to 10 ft-lb will plastically deform even in the presence of a sharp notch.

A copper-base alloy will fracture in a brittle manner only if its microstructure is a nonductile type. A tensile elongation below 2 per cent indicates a brittle condition.

The investigators found a general interrelationship between Charpy V energy, tensile elongation and notch ductility for all copper-base alloys.

Aluminum — Alan B. de Ross, Kaiser Aluminum & Chemical Sales Inc., Chicago, described how limiting the iron content of alloy 356 to 0.15 per cent increases tensile strength from 35,000 to 47,500 psi.

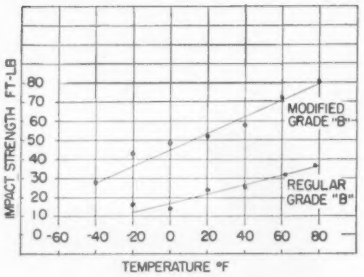
Holding down the iron and other impurities increases the ductility, so that a more complete artificial aging can be used. This develops the full potential strength value of the alloy without brittleness.

Varying the aging temperatures and times produces different combinations of properties. In permanent mold castings mechanical properties range from 41,000 psi tensile strength, 23,000 psi yield strength and 16 per cent elongation to 45,000 psi tensile strength, 34,000 psi yield strength and 8 per cent elongation.

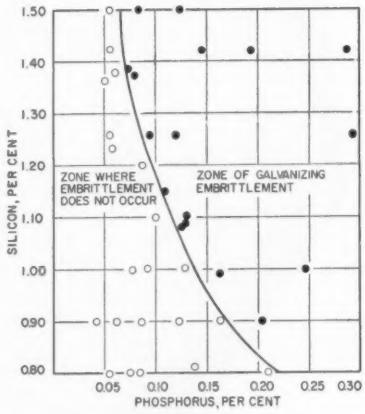
Mechanical properties of sand castings are from 37,000 psi tensile strength, 25,000 psi yield strength and 10 per cent elongation to 41,000 psi tensile strength, 34,000 psi yield strength and 5 per cent elongation.

The addition of 0.60 per cent magnesium to the high purity alloy further increases strength while maintaining fair ductility.

Fatigue Properties—G. W. Stickley and J. L. Miller of Aluminum Co. of America's research laboratories, New Kensington, Pa., studied 218 and 380 alloys and concluded that their fatigue strengths are about the same at room temperature, but 380 alloy is superior to 218 at elevated temperatures.



New steel has higher impact values



Chemistry causes embrittlement

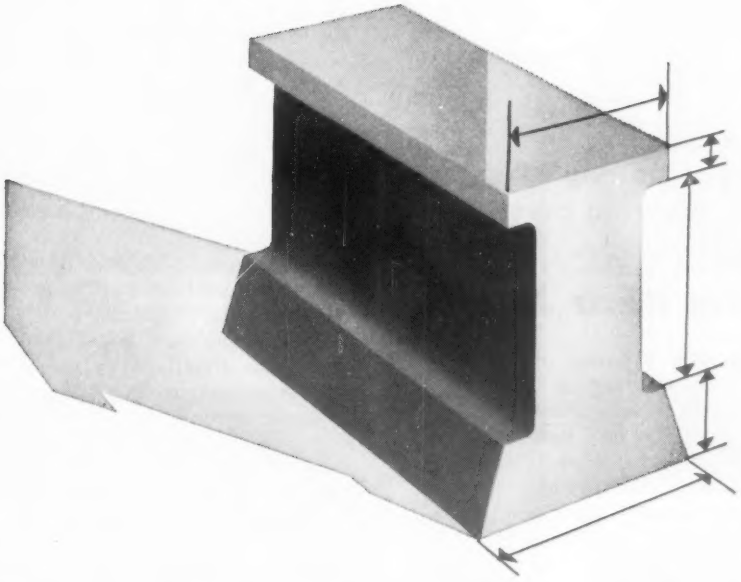
There was no correlation between tensile strength and fatigue strength at room temperature. Fatigue strengths decreased with temperature increases.

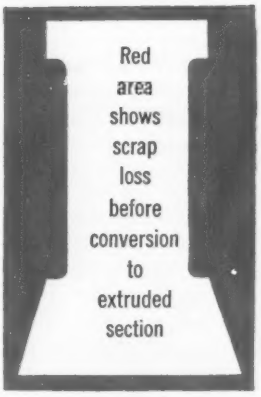
The detrimental effect of notches on the fatigue strength of diecastings subjected to repeated bending or axial stresses is greater for sharper notches and large numbers of cycles of stress. Elevated temperatures decrease the effect of notches.

Corrosion — D. L. Colwell and R. J. Kissling, Apex Smelting Co., Cleveland, concluded from tests on aluminum diecastings that silicon alloys such as 43 and 13 have superior corrosion resistance. Intermediate corrosion resistance is provided by the common diecasting alloy 39. Silicon magnesium alloy 36 was inferior in corrosion resistance.

The experimenters found the corrosion resistance of diecastings made from smelters ingot similar

Cost per clamp cut from $1.06 to 58¢ with J&L hot extruded cold drawn section





This manufacturer cut the cost of contact clamps 45% by converting to J&L extruded sections. Previous cost of $1.06 per part involved costly milling and scrap loss from cold drawn 1½" x 1" flats.

Here's how extruded sections can cut your cost:

1. Eliminate machining and finishing operations.
2. Reduce scrap losses almost to zero.
3. Eliminate cost of casting and forging intricate sections.
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Investigate this new production technique for your shape profiles—within present limits of a design which can be inscribed in a three-inch circle. Available in a wide range of carbon and alloy steels. For specialty alloy and tool steels, submit inquiry. Get complete details by writing to the Jones & Laughlin Steel Corporation, Dept. 404, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

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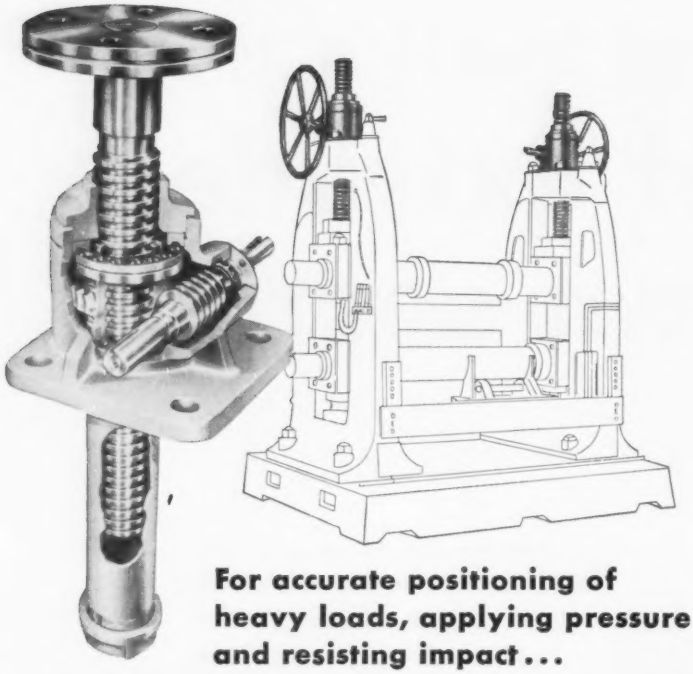

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Duff-Norton Worm Gear Jacks

Duff-Norton worm gear jacks provide a purely mechanical means for accurately positioning loads weighing up to several hundred tons and maintaining them indefinitely without creep. They may be incorporated into the design of a new piece of equipment, or installed in existing facilities to replace other positioning devices. They will operate in any position, and functioning as components of machinery or equipment, worm gear jacks can raise or lower loads, apply pressure, or resist impact.

Capacities range from five to 50 tons. When two or more are connected by means of shafting and mitre gear boxes to raise loads they lift in unison—even when the load is unevenly distributed. Worm gear jacks are available with standard raises up to 25 inches, and will maintain an exact raise through years of service without adjustment. Each of the six sizes has a standard worm gear ratio ranging between 6¾:1 and 32:1. They are made with either square or Acme threads, and give one inch raise for from 10 to 48 turns of the worm. Jacks are suitable for operation at ambient temperatures as high as 200°F.

Thousands of worm gear jacks are in use on feed tables, tube mills, welding positioners, pipe cut-off and threading machines, loading tables, rolling mills, conveyor lines, arbor presses and numerous other types of equipment. To learn how they can improve the performance of your equipment and save you money, write for bulletin AD-34-BB or ask for a Duff-Norton representative to call.

DUFF-NORTON **Duff-Norton Jacks**

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Ratchet Jacks, Screw Jacks, Hydraulic Jacks, Special Worm Gear Jacks, Ratchet Hoists, Electric Hoists, Load Binders, Spur Gear Hoists

to that of diecastings made from the pot metal directly from the reduction cell. They say that iron beyond the 1.3 per cent maximum permitted for the cold chamber machine should be avoided for best corrosion resistance, particularly in 36 alloy. Zinc up to 2 or 2.5 per cent showed no harmful effect on corrosion resistance.

Vacuum Diecasting—David Morgenstern, Nelmor Corp., Euclid, O., states the commercial application of vacuum to diecasting has produced zinc and aluminum castings with properties comparable to nonferrous forgings. The higher strengths of the castings make it possible to reduce wall thicknesses.

Low silicon alloys are used in vacuum diecasting. These castings can be anodized or given a durable, clear finish.

Magnesium—J. E. Niesse, M. C. Flemings and H. F. Taylor of Massachusetts Institute of Technology, Cambridge, Mass., investigated the fluidity of a series of magnesium alloys. In all the alloy systems studied (except the rare-earth systems) they found a sharp drop in fluidity as small amounts of alloying elements were added. The fluidity rose when the alloy content approached eutectic composition. In general, the fluidity varied inversely as the freezing range or temperature difference between the liquidus and solidus.

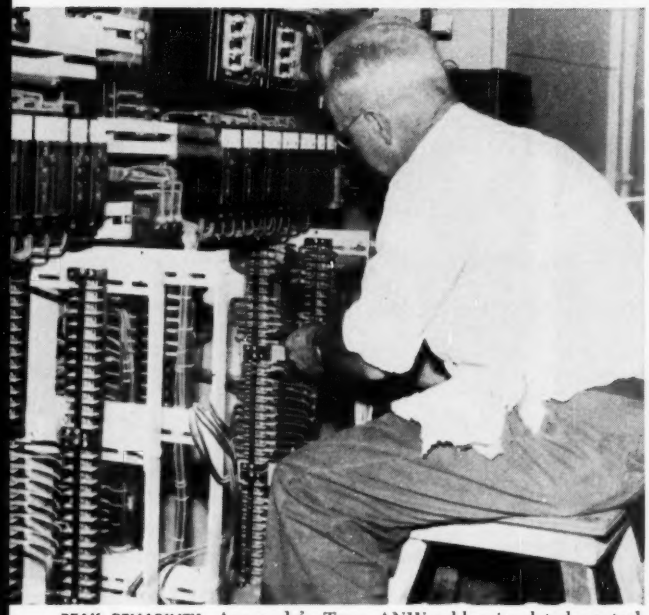
Titanium—Battelle Memorial Institute, Columbus, O., says estimates of the potential market for titanium castings in aircraft range from 25 to 200 lb per plane. The market in the chemical processing industry is believed to be greater.

The report puts the life of machined graphite molds at 15 to 50 castings.

Battelle metallurgists say skull melting furnaces for the casting of titanium seem to hold promise.

Titanium casting may be simplified by a process described by A. L. Feild, E. I. du Pont de Nemours & Co., Wilmington, Del., and R. E. Edelman, Frankford Arsenal, Philadelphia. Their experiments with a mold composition based on sized synthetic graphite powders bonded with nonreactive agents showed that shaped titanium castings (unalloyed) can be made with ordinary foundry techniques.

Whatever you want in control cable—Anaconda has it!



PEAK RELIABILITY. Anaconda's Type ANW-rubber-insulated control cable is a high-quality product which features unusual heat resistance. It is also highly resistant to attack by moisture, acids, alkalies and other chemicals. Individual conductor covering and over-all jacket of neoprene.

MULTIPLE USE. Anaconda thermoplastic control cables can be installed aerially, in conduit, underground in ducts—or buried directly in the earth. They are available with either polyethylene (600 or 1000 volts) or Densheath* vinyl resin (600 volts) insulation and Densheath over-all jacket. Also with Densheath conductor covers on request.

OZONE-RESISTANCE. For station control applications where ozone conditions prevail, Anaconda offers a special low-voltage butyl-insulated cable. This control cable not only resists ozone, but individual conductor covering and over-all jacket of neoprene provide maximum insurance against moisture and mechanical injury.

SPACE-SAVER. You can install a 12-conductor cable in conduit now carrying a 6 or 7—with Anaconda Type PND† Control Cable. Individual conductor coverings of moisture-, oil- and gasoline-resistant nylon. Over-all Densheath jacket. Designed for general-purpose control requirements where space is a limiting factor.

Permanent Full Color Coding on rubber cables, by means of Anaconda's rubber-base coating, assures quick and positive circuit identification. Coding by surface printing, which conforms to IPCEA standards, also available. On thermoplastic cables, full color coding with pigmented insulation and surface printed coding are likewise offered. For information on any of Anaconda's Control Cables—including cables engineered for more specialized control requirements—see your Anaconda distributor or the Man from Anaconda. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

*Reg. U.S. Pat. Off. 57389
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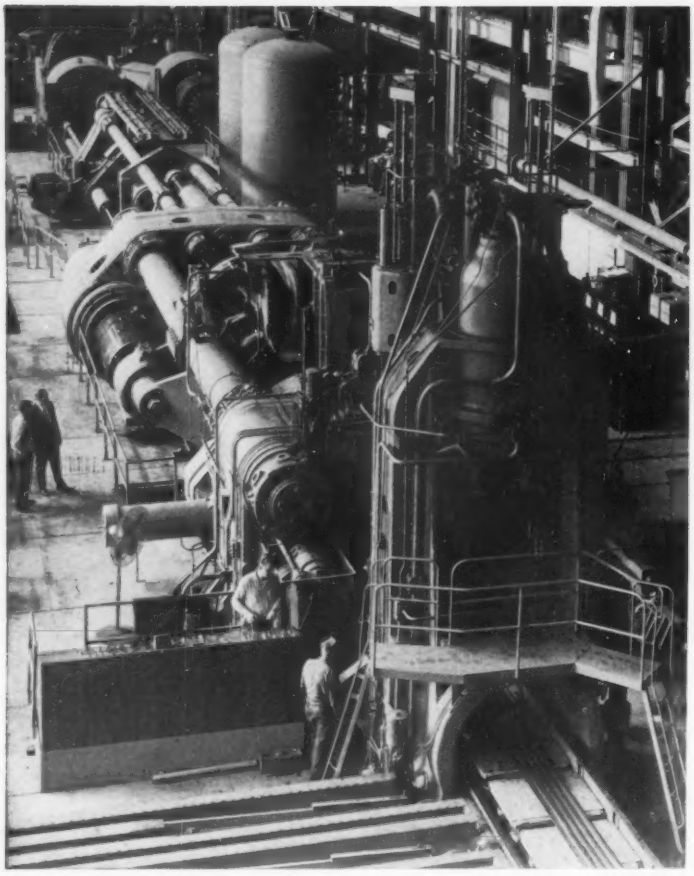
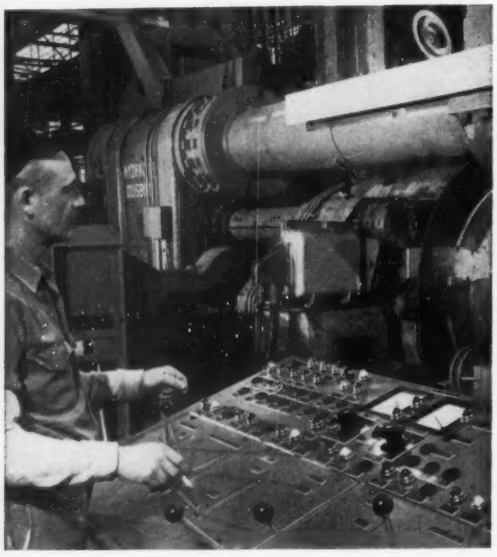
FOR CONTROL CABLE



Extruding 18-in. landing mats for the U.S. Army. The 13,200-ton unit is said to be the largest press ever used to extrude magnesium



Ram is controlled from this console. It is ready to push a 16-in. billet into container

Because of its high pressures, you can expect improved, larger magnesium extrusions for industry and military uses

Dow Unveils Giant Extrusion Press

BIGGER and better magnesium extrusions are on their way.

Dow Chemical Co. has taken the wraps off a 13,200-ton extrusion press at its Madison, Ill., plant. Here are some of the products it will make:

- Structurals 18 in. wide for portable airplane landing mats.
- Precurved printing plates.
- Integrally stiffened sections 9 to 20 in. wide.
- I-beams with webs 11 to 28 in. high.
- Tubing, 10 to 24 in., for missile bodies.

Other Benefits—The press can extrude all the common shapes plus some others that used to require separate operations. It's equipped with a 3000-ton piercer for hollow extrusions. A double-locking frame aids in making complex stepped extrusions and combination hollow forgings. By using the piercer and frame together, Dow has extruded hollow propellers.

These are a few of the auxiliary items:

A 1000-ton stretcher which can handle extrusions 80 ft long with a cross section of 40 sq in. Jaws can hold pieces 40 in. wide.

Induction heaters that can handle 20,000 lb of billets an hour.

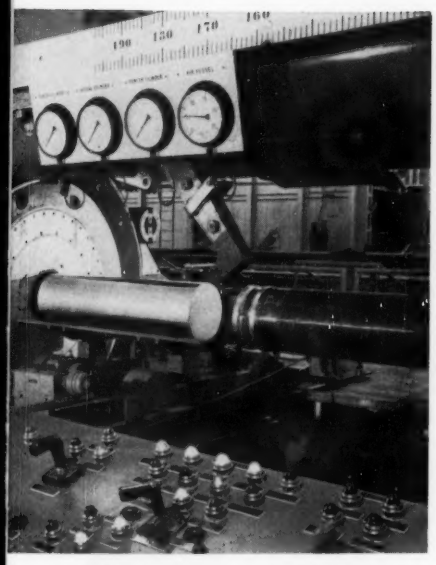
An aging oven that holds 320,000 lb of magnesium.

A contour correction machine. (It can handle extrusions as large as 18 by 32 in.)

A tubing and round straightener.

Increased Strength — The high ratio of pressure to ingot area makes possible the extrusion of exceptionally thin walled or bulky shapes. A billet 32 in. in diameter can be extruded under 33,000 psi.

High pressure also permits lower extrusion temperatures. The result is a substantial increase in the compressive yield strength of the extrusions. When the alloy ZK60A is extruded at 700°F, it is 34,000 psi; extruded at 500°F, it's



(left). Press can exert 130,000 psi on this size billet

37,000 psi. The combination of high pressure and a somewhat lower temperature than 700°F gives the alloy a compressive yield strength of 39,000 psi, say Dow Chemical engineers.

Bigger, Better—Extrusions with improved physical properties can now be made 50 to 100 per cent larger than those made on smaller presses.

The press also produces forging stock 18 in. in diameter—large enough for the 50,000-ton forging presses used for military aircraft parts. Dow expects to make extrusions with cross sections that will just fit into a 32 in. circle. The press converts billets with inside diameters of 16 to 32 in. into extrusions as long as 80 ft.

Dow's press handles aluminum. (The Air Force has ordered a large number of these extrusions for the B-52 program.)

Machinery—Hydraulic pressure for the press is furnished by a 43,000-gallon accumulator system. Pressure stages range from 3000 to 13,200 tons. Maximum hydraulic pressure of 130,000 psi can be exerted on billets 16 in. in diameter.

Total weight of press and accumulator station is 2800 tons.

The original press, made by Hydraulic GmbH, Duisberg, Germany, was liberated at the end of World War II by American forces.

Treated Steel Replaces Tin Plate

Black plate treated by a new chemical process has greater resistance to alkalinity than tin plate. Coating also provides good corrosion resistance for other metals

SOME major can manufacturers are making detergent containers out of black plate that has been given a new chemical surface treatment.

Its two big advantages: Tin for making tin plate has become a strategic metal, and, in this application, black plate is superior to tin plate because it has greater resistance to alkalinity.

Process — The chemical treatment, known as the Hinac process, was developed by Heintz Mfg. Co., Philadelphia. It produces an inorganic coating consisting essentially of chromium compounds.

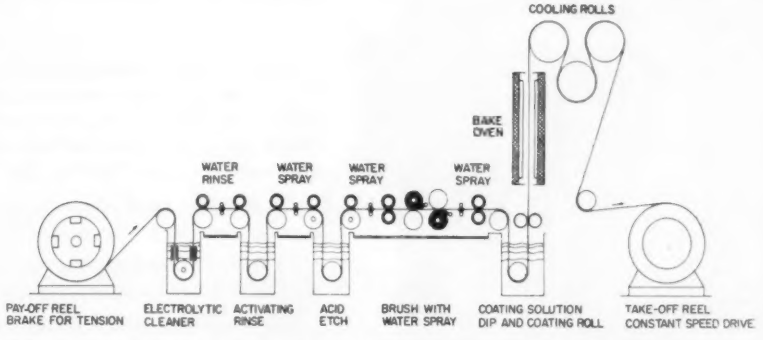
Almost any metal can be treated. Coatings on aluminum, zinc, stainless, copper and magnesium have shown good results.

Properties—The coating is insoluble in water and has good chemical resistance. Corrosion resistance of the bare coating is high. Lacquer, varnish or paint have good adherence to the coating, and the underfilm paint corrosion resistance is exceptionally high.

The coating is smooth and imparts a high luster to the surface of metals. Its scratch resistance is superior to that of an iron phosphate coating of comparable weight, says Heintz.

The process is particularly adaptable to high speed operations such as strip and sheet lines since it takes only a few seconds. All chemical treatment steps involve nonsludging and nonelectrolytic baths operated at room temperatures. The composition and thickness of the coating can be varied to suit the product.

Producer—Hinac treated black plate (carbon steel 0.01 in. thick) is being produced by Bethlehem Steel Co., Sparrows Point, Md., on a pilot line that has been in continuous operation since August, 1954. Most of the material is used by American Can Co., Continental Can Co. and National Can Co.



Schematic of Bethlehem's line for producing Hinac treated black plate

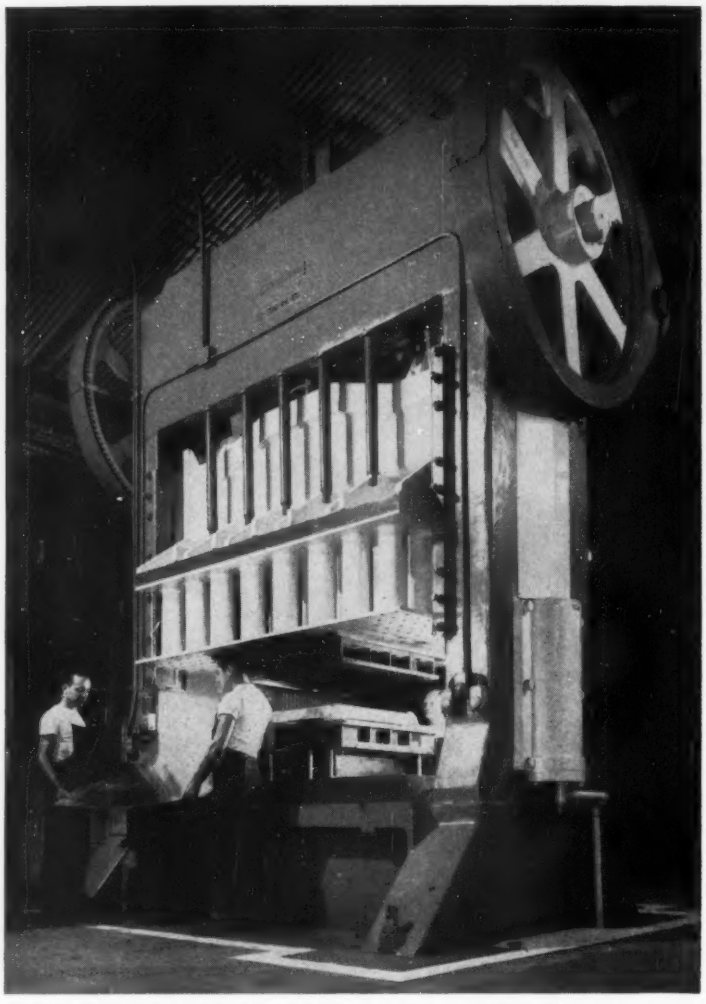
Standards Circular Available

The National Bureau of Standards has issued a 24-page circular on its more than 500 standard samples and reference standards (chemicals, ores, ceramics and metals).

The standards are used in industrial and research laboratories to control manufacturing processes and evaluate accuracy of apparatus and equipment. Write: Superintendent of Documents, Government Printing Office, Washington 25, D. C. Ask for NBS Circular 552 (second edition). Price is 25 cents.

Cleveland Press speeds production at International Metal Products Company

famous **arctic circle**
air cooler parts completely formed
in just one stroke!



Cleveland Straight Sided Double Crank Press, 300 ton capacity, two 25 ton air cushions.

Cabinet fronts and grills for this famous
arctic circle
air cooler are formed in a single stroke.

"This Cleveland Press is one of our more versatile pieces of equipment. We do the greatest portion of our deep draw work on this press. The large bed area permits us to mount as many as four dies; thus we draw, blank, punch and form cabinet fronts and grills in a single stroke. We also use it for large blanking and multiple forming operations".

G. J. Rice, plant engineer at International Metal Products Co. of Phoenix, concluded his recent letter by stating,

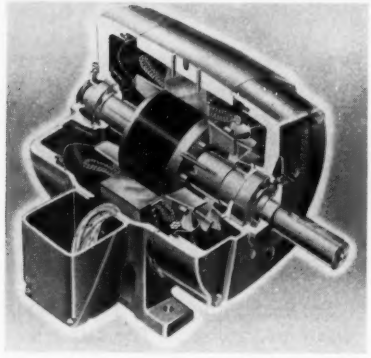
"*Clutch performance has been outstanding.* Other than normal adjustments there has been very little maintenance required on this press".

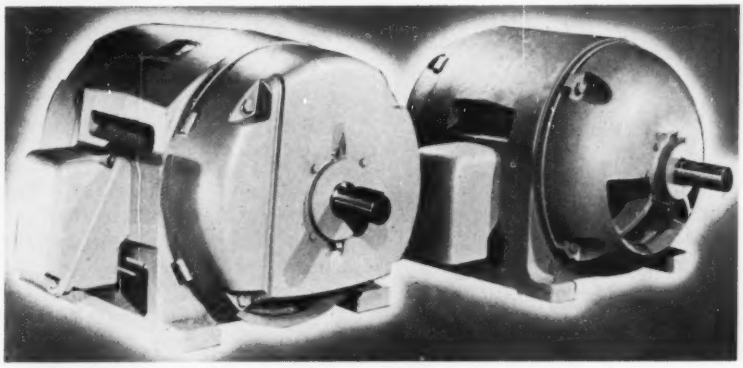
You, like many other leading manufacturers, will find many advantages in new Cleveland Presses. There are 11 types in a wide range of sizes. One of these will exactly meet your requirements . . . will assure lower stamping costs, faster production. A Cleveland engineer will gladly advise you for most advantageous selection. Just write or call today!

The CLEVELAND Punch & Shear Works Co.
Power Presses • Fabricating Tools • Punching Tools and Dies
East 40th and St. Clair Avenue, Cleveland 14, Ohio
Offices at: New York • Chicago • Detroit • Philadelphia • East Lansing • Cincinnati

THE CLEVELAND PUNCH & SHEAR WORKS CO.
Established 1880

Induction Motor Line Packs More Power in Lighter Frames





Sectioned motor shows new NEMA design. New motor, center, is rated at 125 hp; old motor, right, is 75 hp

Alternating current motors from 40 to 125 hp have been redesigned to take advantage of advances in metallurgy, insulating materials and new production techniques.

The new models weigh from 100 to 500 lb less than comparable models in the old line. Average weight reduction is 20 per cent.

Lineal dimensions have been reduced an average of 10 per cent and volume an average of 27 per cent.

The weight and space savings are largely the result of insulation improvements which permit the use of thinner and more effective materials.

Motors for Class A uses have slot cell insulation with double-backed Mylar polyester to provide greater physical and dielectric strength.

Top sticks of nonhygroscopic glass have improved dielectric strength and higher heat resistance.

Wire for stator windings is shaved after drawing to smooth the surface. This reduces chances of tiny barbs piercing the insulation. Windings are coated with varnish in an automatically timed dipping and baking process which maintains correct viscosity and the most consistent coverage and penetration.

The problem of loose wires and wire fatigue on two-pole motors is reduced by the use of glass cloth phase strips.

A completely enclosed cast iron sealed bearing housing in the endshield is used to hold grease. Its increased capacity permits the use of a new synthesized grease with a controlled bleeding rate.

The cast iron frame of the open dripproof motor has a larger area. This enables the motor to be used where a splashproof design formerly was required.

Double end ventilation is used. Air enters under both endshields, is drawn over the stator windings and out the protected air exhausts on both sides of the frame. *Write*: General Electric Co., Schenectady 5, N. Y. *Phone*: Franklin 4-2211

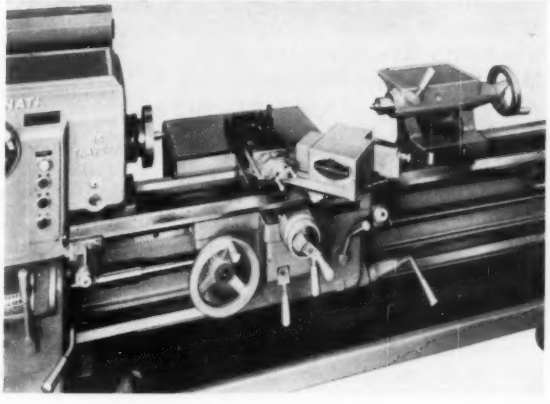
Tracer Lathe Turns Multiple Diameter Shafts

The Hydraguide tracer lathe automatically turns tapers, shoulders, necks, contours and multiple diameter shafts.

A single pushbutton starts tracer mechanism. For manual operation of the lathe, the tracer is locked out by retracting the tracer slide and pushing a single control button.

The tracer mechanism is mounted in the carriage. All controls, template, tracer finger and tools are on the operating side of the lathe.

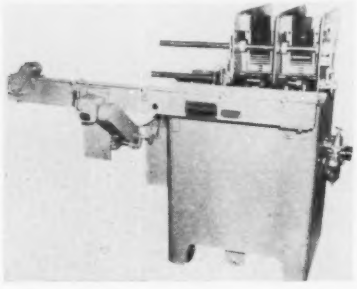
Center distances of the lathes are from 30 to 114 in. Swing sizes are 15 and 18 in. There are 12 spindle speeds from 37 to 1470 rpm. Thread range: 1½ to 92 threads per inch. *Write*: Cincinnati Lathe & Tool Co., Cincinnati 9, O. *Phone*: Redwood 1-2121



NEW PRODUCTS and equipment

Bar Feeder

Model 1700-B feeds 50 parts a minute into drilling machines, milling machines and other high speed equipment.

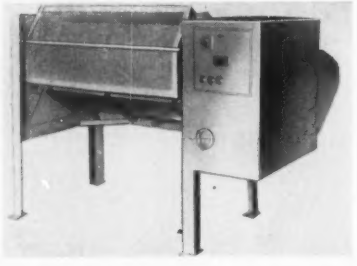


Two parts are fed at a time. Two feed chutes arrange the parts on an external feed track and orient them to flow into the machine at any desired speed.

Parts of various lengths can be handled. *Write*: Feedall Inc., 38399 Pelton Rd., Willoughby, O.

Barrel Finisher

Model V-16 does tumbling, burnishing and deburring operations. It has a variable speed, direct gear drive. Speeds range from 8 to 25 rpm.



Barrels have from one to four compartments. Capacity is 16 cu ft. *Write*: Rampe Mfg. Co., 14915 Woodworth Ave., Cleveland 10, O. *Phone*: Mulberry 1-2800

Burnishing Compound

For use with all types of barrel finishing media or with self-tumbling work, Oakite FM-103 produces a smooth, bright finish, prevents tarnishing during burnishing, rinses freely and is economical to use.

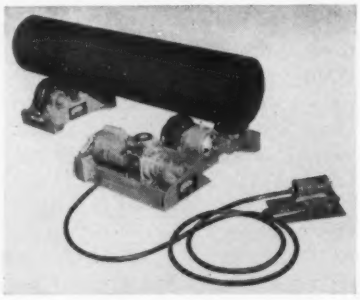
It works well on aluminum, copper, brass, nickel-silver, gold and mild and hardened steel. With a pH of 8.5 to 8.6, the compound contains no ingredient which would encourage the growth of bacteria or cause dermatitis.

Solution concentrations of 1 to 2 ounces per gallon of water develop good luster on metal surfaces. *Write*: Oakite Products Inc., 134E Rector St., New York 6, N. Y. *Phone*: Whitehall 3-0940

Turning Rolls

M-15 portable pipe rotators are used to rotate pipe and cylindrical shapes for flame cutting and welding. They consist of one variable speed powered rotator and one idler rotator.

All wheels on power and idler units have rubber tires. Capacity of one power and one idler unit is



1500 lb total load. More than one idler can be used where long joints of pipe are to be welded or where load capacity needs to be increased.

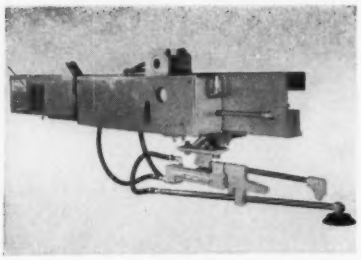
Wheel centers on both units are fixed, requiring no adjustment on 2 to 24 in. pipes. A unit is available that has adjustable spacing to handle work up to 8 ft in diameter. *Write*: Reed Equipment Division, Webb Corp., Webb City, Mo. *Phone*: Webb City 29

Automatic Press Unloader

The Vac-Hand can be used for automatic handling of sheet metal parts in stamping presses and parts in plastic molding machines.

The gripping mechanism, shown mounted on a straight-line press unloader, has a rubber suction cup on the end of an adjustable rod. To secure a part, a vacuum is drawn on the cup. The rod is pivot-mounted and is advanced and retracted by an air cylinder operating on 45 psi line pressure.

The flexible rubber cup con-



forms to both flat and curved surfaces. It can be mounted in any radial location to suit a wide range of unloading requirements. *Write*: Press Automation Systems Inc., 25418 Ryan Rd., Centerline, Mich. *Phone*: University 4-2018

Quick Drying Spray Paint

Tropical Spray Mill White ends messy overspray. The flat white coating dries so rapidly that overspray dries in the air and falls to the floor where it can easily be swept up.

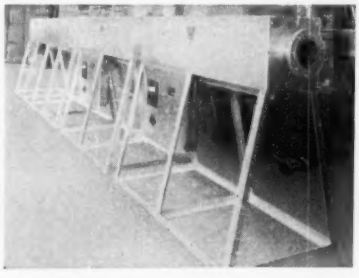
The paint has good hiding ability, making it possible to cover most old painted surfaces or newly primed ones in one coat. A synthetic alkyd, the paint has proved to be durable on a variety of interior surfaces, such as wood, metal, wallboard, plaster and concrete.

It is recommended for use on large interior wall and ceiling surfaces in plants, warehouses and similar buildings. *Write*: Tropical Paint Co., 1246 W. 70th St., Cleveland 2, O. *Phone*: Olympic 1-5900

Tube Furnace

This sectionalized electric furnace can heat treat wire, rod or strip steel continuously. It is assembled in units (5 or 11 ft long). Each has it own controls.

A typical unit, with maximum operating temperature of 1250°F, is 17 in. wide, 17 in. high (plus legs) and 11 ft long. The hot

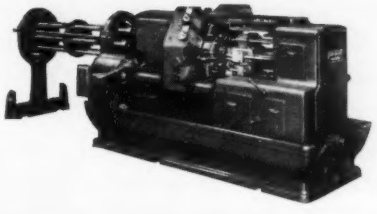


AUTOMATIC BAR MACHINES

HELP YOU BEAT RISING PRODUCTION COSTS

The cowman achieves speed and power in a good "using" horse by years of careful breeding . . . Greenlee develops these same qualities in its Bar Automatics by continuous research and design improvement. One of the many superiorities of this speed and power is that it enables you to take full advantage of modern tooling practices. Your Greenlee representative will be glad to show you how it is done. Please submit print when inquiring about a specific job.

Write for Catalog No. A-405



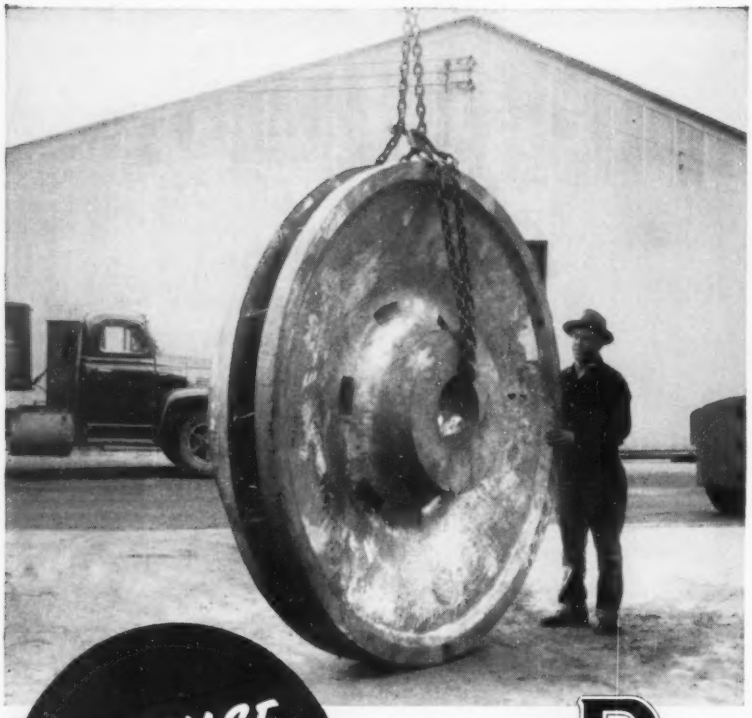
SIX AND FOUR-SPINDLE AUTOMATIC BAR MACHINES

GREENLEE Special Machine Tools

- Multiple-Spindle Drilling and Tapping Machines
- Transfer-Type Processing Machines
- Hydro-Borer Precision Boring Machines

GREENLEE BROS. & CO.

1926 MASON AVE.
ROCKFORD, ILL.



IMPULSE RUNNER

DURALOY

It's a 7 ton 18-8 Casting designed to handle acidulous water

With our battery of large electric furnaces and our large modern well equipped molding department, castings of this size are quite common in our production schedule.

Yet, if you require it, we can produce castings as light as only a few ounces. In fact, with our shell molding department we can produce in quantity very small pieces of any high alloy analysis desired.

Experience? Well, our work with static high alloy castings goes back to 1922 and with centrifugal castings back to 1931. This long experience is your assurance of a sound casting correctly alloyed.

The DURALOY Company

OFFICE AND PLANT: Scottdale, Pa.

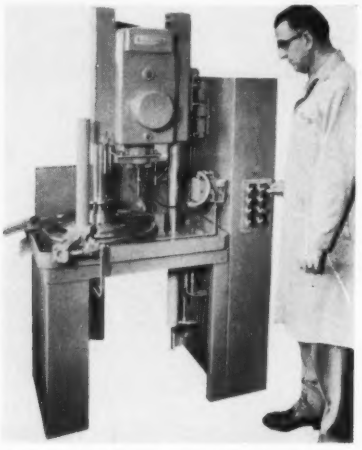
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
ATLANTA OFFICE: 76—4th Street, N.W.
CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23906 Woodward Avenue, Pleasant Ridge, Mich.

zone is 6 in. in diameter and 10 ft long. The muffle is 6 in. ID alloy tubing. *Write*: Pereny Equipment Co., 893 Chambers Rd., Columbus 12, O. *Phone*: Axminster 9-8444

Honing Machine

The model 10A1 vertical is for manual or automatic honing of bores ⅜ to 1 in. in diameter. It is mechanically and air actuated.

A double post arrangement with the spindle suspended in line between the posts provides rigidity and accuracy. By use of the vertical spindle, coolant flow is directed away from moving parts at all points.



Maximum spindle travel is 2½-in., with a 6 in. lift-out stroke. Power is supplied by a ¾-hp motor. *Write*: Barnes Drill Co., 854 Chestnut St., Rockford, Ill. *Phone*: 4-8661

Tiering Truck

Loads are picked up and deposited by this electric truck in aisles no wider than the length of the truck and its forks. No extra space is needed for maneuvering.

To pick up a palletized load, the operator extends (hydraulically) the forks into the pallet. Next, the load is lifted over the load wheels, and forks and load are retracted into the truck.

All widths of pallets can be handled. Truck capacity is 3000 lb. *Write*: Department R-8, Lewis-

NEW PRODUCTS and equipment

Shepard Products Inc., 125 Walnut St., Watertown 72, Mass. *Phone*: Watertown 4-5400

Milling Machines

Horizontal, vertical and angular work can be done by each machine in this line of ram type millers.

Models 24LA and 24MLA have nine speeds from 50 to 1400 rpm. Model 24MA has 12 speeds from 40 to 1600 rpm.

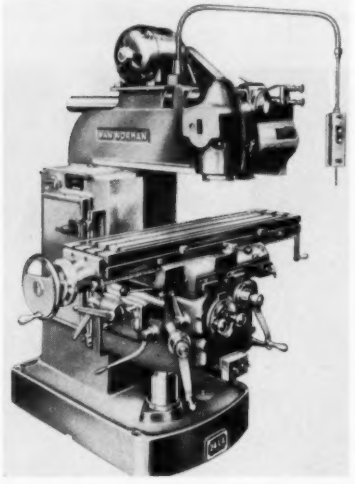
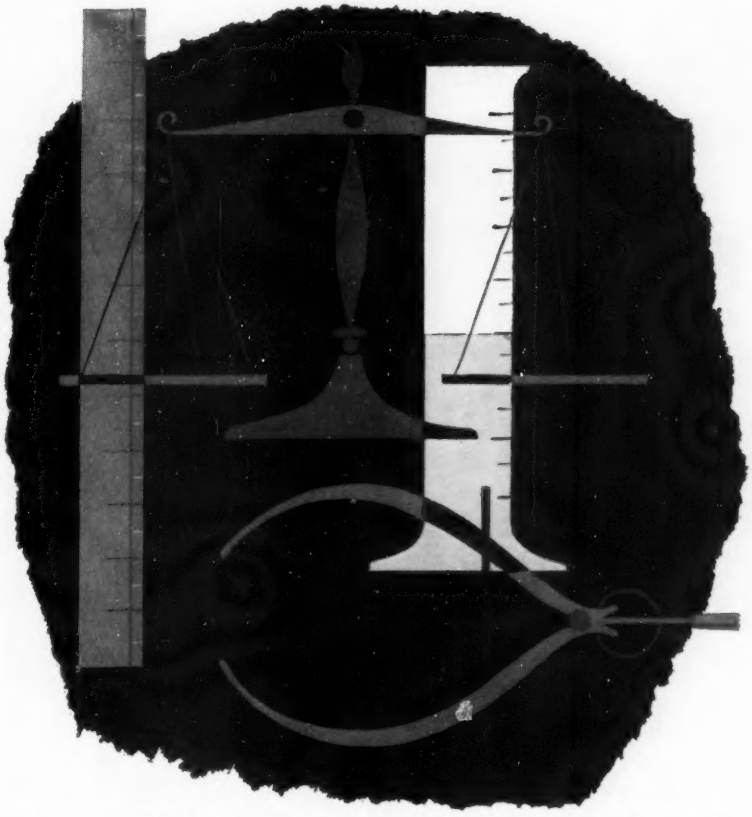


Table size of models 24MA and 24 MLA is 12 x 50 in. The 24LA has a 10½ x 50 in. table. *Write*: Van Norman Machine Co., Springfield, Mass. *Phone*: Republic 7-4721

Automatic Cleaning

Metal stampings are cleaned, phosphate coated and dried by this machine. Model CP has an overhead



how do you measure economy?

economy is not measured by price alone!

PROVED OVER THE YEARS

When you are concerned with metal abrasives there are many yardsticks that must be applied to truly measure economy.

How long will an abrasive last? How long before it breaks down into fines and becomes inefficient?

How destructive is the abrasive to machinery and equipment?

How efficiently does it perform and what is the time cycle for good performance?

To sum it all up — the economy of using any abrasive can be measured by the **cost per ton of metal cleaned!**

On every count, Malleabrasive has proved its superiority over the years in hundreds of plants.

If you want to improve the economy of your blast cleaning operations — check Malleabrasive.

MALLEABRASIVE

THE GLOBE STEEL ABRASIVE CO., MANSFIELD, OHIO ®

1907—Fiftieth Anniversary—1957

NEW OAKITE CLEANERS
GIVE YOU MORE FOR YOUR
PAINT-PREPARATION DOLLAR

Here are 4 ways to end pre-paint metal-cleaning troubles

Does your trouble chart show that you need better cleaners, strippers or surface conditioners?

- ☐ Cleaning solution foams excessively in spray washing machine. See 1 below.
- ☐ Streaky discolorations or powdery residues cling to surface of steel parts being stripped for repainting. See 2.
- ☐ Zinc phosphating process too difficult to control . . . Iron phosphating process doesn't show good results in salt spray tests. See 3.
- ☐ Too many operations—cleaning, pickling, neutralizing, etc.—are needed to prepare steel that does not require phosphating before painting. See 4.

Here are brief descriptions of new Oakite materials designed to end these particular troubles:

1. For a spray washing solution that does not foam at high pressure, try Oakite Composition No. 161. Does not attack aluminum.
2. For stripping pigmented paint, phosphate coatings and undercoat rust *in one operation*, try Oakite Rustripper.
3. For a zinc phosphating process that is truly easy to control, try new Oakite CrysCoat SW . . . For salt spray results far beyond the capacity of ordinary phosphating processes, try new Oakite CrysCoat No. 89.
4. For *one-operation* removal of rust, heat scale, welding residues and light soil together with good preparation for painting, try Oakite Compound No. 131. Inhibited against attack on steel.

FREE Check the coupon and we will send you free booklets or bulletins with full information on new Oakite cleaners.

OAKITE PRODUCTS, INC.
34E Rector Street, New York 6, N. Y.

Send me free booklets or bulletins giving complete information on the new Oakite materials checked below:

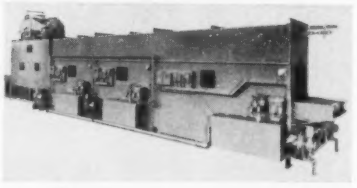
- ☐ Oakite Composition No. 161
- ☐ Oakite Rustripper
- ☐ Oakite CrysCoat SW
- ☐ Oakite CrysCoat No. 89
- ☐ Oakite Compound No. 131

NAME _____

COMPANY _____

ADDRESS _____

NEW PRODUCTS and equipment



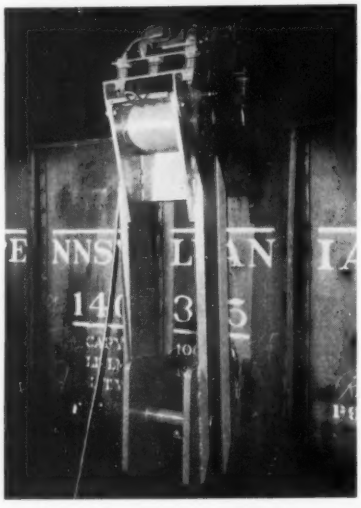
conveyor and a flat wire mesh belt conveyor to carry parts through the timed cycles.

The conveyors can be operated independently.

The conveyors pass through a single tunnel. Solution tanks, spray system and headers are used in common. *Write*: Department S, Alvey-Ferguson Co., 1448 Disney St., Cincinnati 9, O. *Phone*: Redwood 1-7000

Car Shaker

This unit combines the impact features found in car shakers which operate on the top edges of the car only with the vibration features found in car shakers which hang on the car side and are clamped to the underframe of the car.



It is designed to expedite the unloading of materials from hopper bottom, open top, railroad cars. It is particularly effective in loosening stubborn or frozen materials. *Write*: Eastern Constructors Inc., Poland, O. *Phone*: Plaza 5-5432

NEW Literature

Write directly to the company for a copy

Thermocouple Tubing

Bulletin 118, 3 pages, describes alloys used for thermocouples—copper-nickel, nickel-chromium, a magnetic nickel-base alloy and a high purity iron. Superior Tube Co., 1585 Germantown Ave., Norristown, Pa.

Threading Heads

Bulletin F-90-3, 28 pages, describes heat treated threading heads. Landis Machine Co., Waynesboro, Pa.

Plug Gage Chart

Types, sizes and specifications of gages from ⅛ to more than 2 in. in diameter are listed in this chart. Gage Division, Pratt & Whitney Inc., West Hartford, Conn.

Induction Motors

Bulletin GEC-1419, 4 pages, lists uses, ratings, types, frame sizes and construction features of ¾ to 5 hp single phase motors. General Electric Co., Schenectady 5, N. Y.

Conveyor Belt

This bulletin describes a flexible belt engineered for small diameter pulleys. Main Belting Co., division of Russell Mfg. Co., 220 E. Main St., Middletown, Conn.

Turret Punch Presses

Machines for short run piercing of truck parts and related equipment are described in bulletin 600 TR, 6 pages. Wiedemann Machine Co., 545 Wissahickon Ave., Philadelphia 32, Pa.

Flat Nut Fasteners

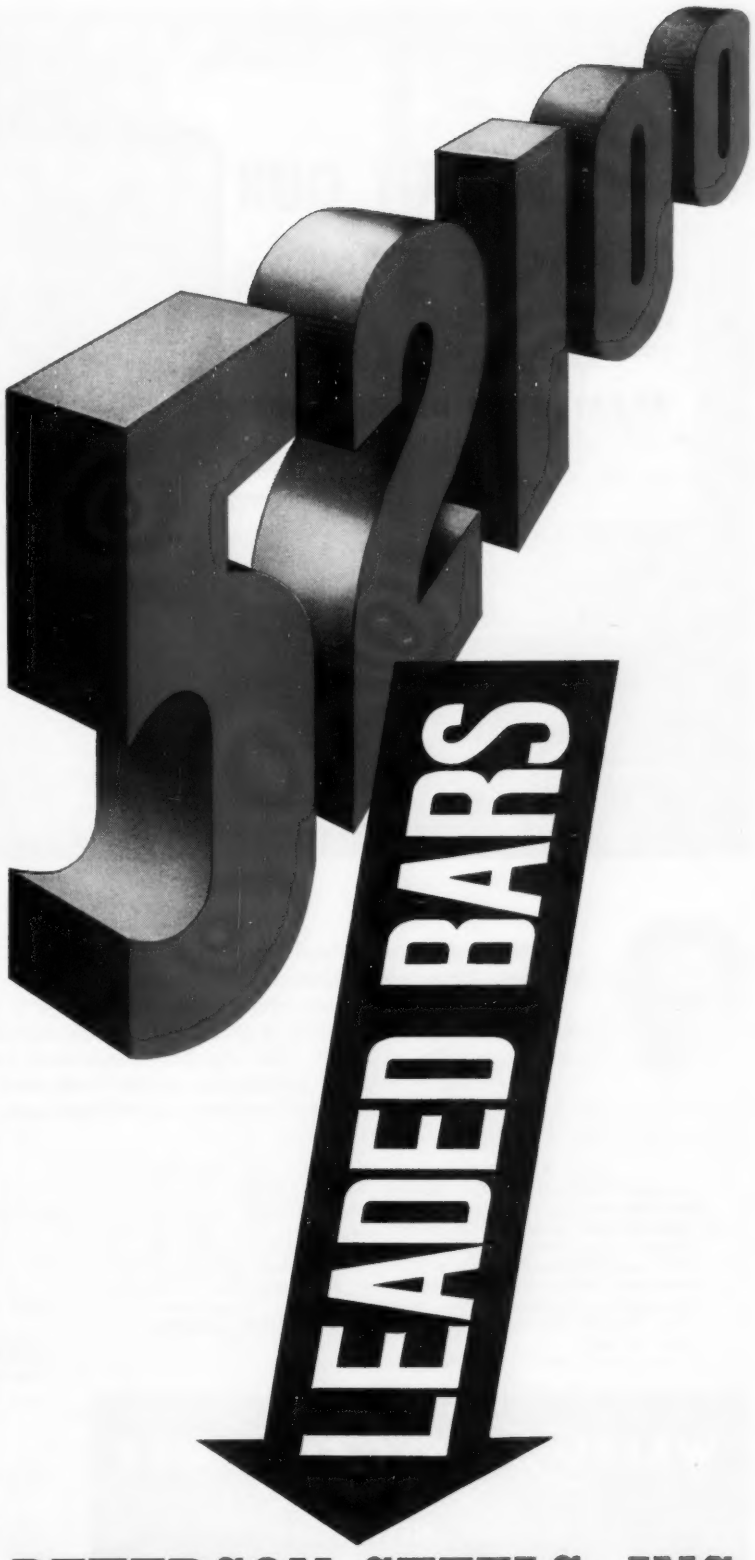
A 4-page bulletin presents data on length, width, material thickness and screw size. Prestole Corp., 1345 Miami St., Toledo 5, O.

Welding Blowpipes

This 4-page bulletin 1007 describes blowpipes that operate at acetylene pressure of less than 1 lb per square inch. Linde Co., division of Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y.

Finishing Compounds

Catalog 10, 48 pages, describes formulations for cleaning, stripping, deburring, etching and other finishing operations. Frederick Gumm Chemical Co. Inc., 538 Forest St., Kearny, N. J.



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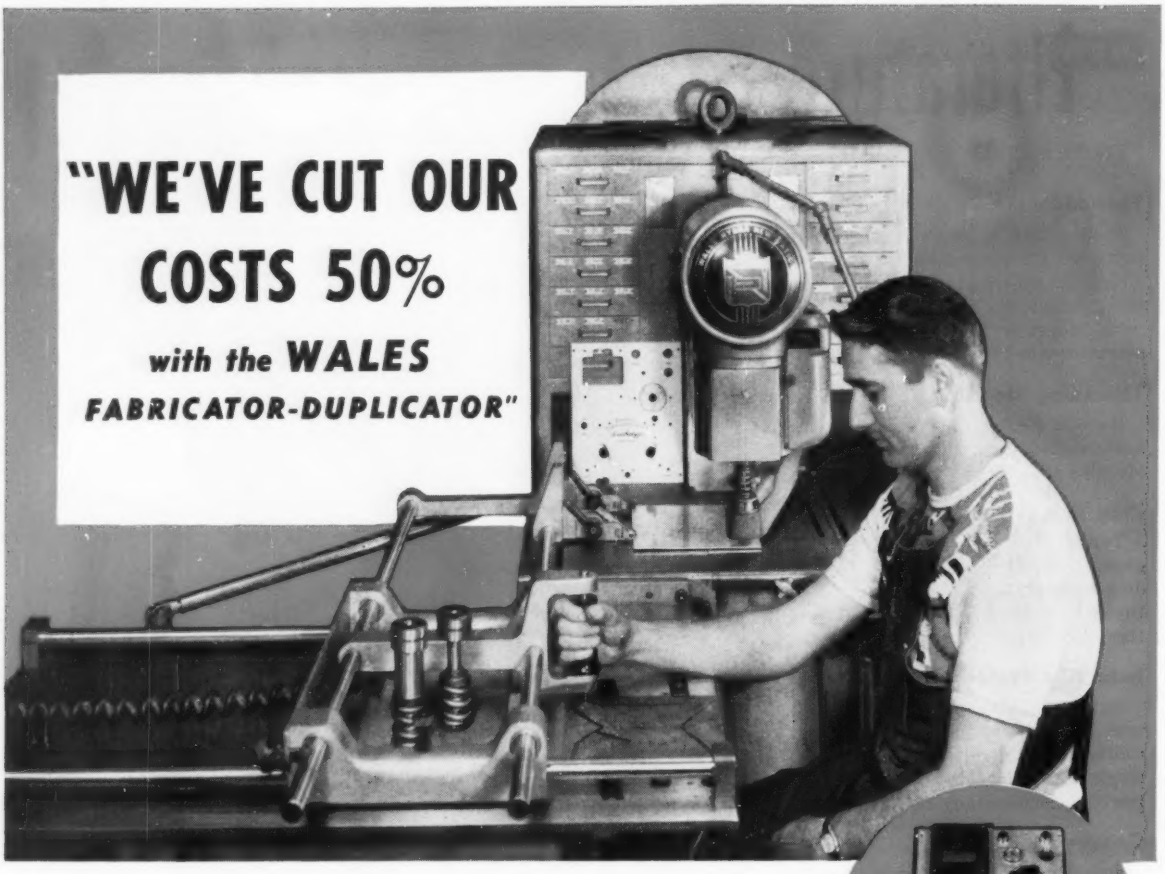
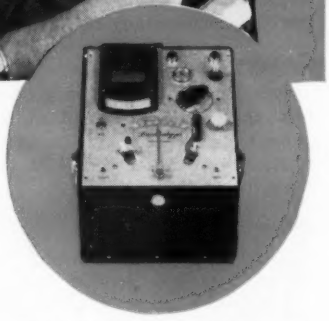


Mr. Richard H. Aufderheide, President and Production Manager of Rex Metal-Craft Inc., Indianapolis, Indiana reports: "We have been able to cut our costs 50% by using the Wales Fabricator and Duplicator for the manufacture of the Breathalyzer. This punching equipment has proven highly efficient for fast set-up, close tolerance, short to medium production work."



The Breathalyzer is an instrument for determining immediately the degree of alcoholic intoxication. This instrument is used widely by law enforcement agencies and Laboratories.

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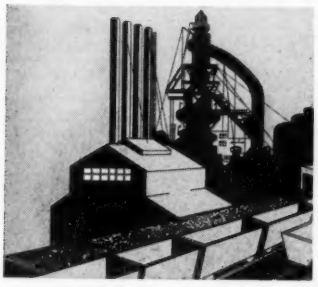


Steel Industry Capacities

Want to know how much steel can be produced? Here's the answer. This is the first report in three years on the iron and steel producers' capacities

CONTENTS

Finished Steel Capacity 116
H. R. Capacity by Products 116
H. R. Capacity by Company ... 116
H. R. Capacity by Geographic Location 116-117
Structural Shapes 118
Piling 118
Plates 118
Rails 118
Long Joint or Splice Bars, Tie Plate Bars 118
Wheels and Axles 118
Hot-Rolled Sheets 118
Coils for Black and Tin Plate ... 118
Blooms and Billets 118
Skelp 118
Sheets (C. R., Galv., Long Terne) 119
Hot-Dipped Tin and Terne Plate 119
Electrolytic Tin Plate 119
Splice Bars, Other Rail Joints ... 119
Tie Plates 119
Track Spikes 119
Strip (C. R. and Galv.) 119
Hot-Rolled Strip 120
Blanks, Rounds and Billets for Seamless Tubes 120
All Other H. R. Products 120
Pipe and Tubing 120
Hot-Rolled Bars 121
Cold-Finished Bars 121
Wire Rods 121
Wire and Wire Products 122
Company Addresses 122, 124, 128, 129
Steel Ingot Capacity 123, 124, 125
Blast Furnace Capacity 126
Coke Capacity 127, 128
Canadian Capacities 129, 130

THIS 16-page section will give you the latest information on steel industry capacities.

It contains summary tables from the 510-page 1957 *Directory of Iron & Steel Works of the United States and Canada*. The directory, issued by the American Iron & Steel Institute, 150 E. 42nd St., New York 17, N. Y., is published every third year.

The summaries in this section cover steelmaking, blast furnace, cokemaking and finished product capacities. The figures include new facilities that began operating in the first quarter of 1957. Only once in three years are finishing capacities reported by the AISI. It reports annually on steelmaking, blast furnace and cokemaking capacities.

In addition to capacities, this section contains a list of the steel companies and the home office address of each.

The 1957 directory shows that total hot-rolling capacity has kept pace with the rise in ingot capacity. Many people are inclined to measure steel industry expansion by the increase in ingot capacity. But steel ingots are useless without sufficient rolling capacity of the right kind in the right place.

In 1954, the industry's hot-rolling capacity of 96,641,240 net tons was equal to 77.7 per cent of the ingot capacity of 124,330,410 net tons. In 1957, the hot-rolling capacity of 103,622,230 net tons is equal to 77.6 per cent of the 133,459,150 net tons of ingot capacity. While total hot-rolling capacity has risen, some products showed declines, particularly the railroad products.

Some steel products require finishing beyond hot rolling. This section shows capacities, company by company, for those products.

Twenty-eight states have steelmaking furnaces, 18 have blast furnaces, 29 have hot-rolled steel capacity and 27 have capacities to make other forms of finished steel.

To expand capacities and to replace worn-out facilities, the steel industry has spent $2,610,000,000 in the last three years, the AISI reports. The breakdown: $680 million in 1954, $730 million in 1955 and $1.2 billion in 1956. The 1957 expenditure is expected to be $1.7 billion.

The steel industry will continue to spend heavily for years to come. Companies are planning additional expansion and improvement programs well beyond 1957. The industry must meet the needs of a growing population and at the same time provide increasing amounts of improved types of steel for critical uses. Aircraft and nuclear applications are examples.

An extra copy of this 16-page section is available until supply is exhausted. Write: Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.

Finished Steel

U.S. CAPACITY for hot rolling of finished steel is 7.2 per cent larger than it was when the American Iron & Steel Institute made its triennial report on finishing capacities in 1954.

Hot-rolling capacity is now 103,622,230 net tons a year, a gain of 6,980,990 tons over the 96,641,240 tons of capacity in 1954.

The No. 1 product tonnagewise is hot-rolled sheets, with 33,529,170 net tons of capacity annually. Next largest is hot-rolled merchant bars, with a yearly capacity of 14,027,520 tons, located in 23 states.

In addition to showing a table of hot-rolled product capacities, this page and the adjoining one alphabetically list the companies and their hot-rolling capacities and provide a state-by-state and city-by-city listing of the companies and these capacities.

Five of the succeeding pages show company-by-company capacities for the various hot-rolled steel products and for products that require further finishing.

HOT-ROLLED STEEL CAPACITY

By Products and Companies

Products	Annual Capacity Net Tons
Rails—Standard, over 60 lbs. per yard	1,598,500
" —60 lbs. or less per yard	106,700
Long joint or splice bars and tie plate bars	619,600
Structural shapes—Heavy	7,628,400
Steel piling—(Rolled)	399,000
Plates—Sheared	7,917,000
" —Universal	1,310,500
Hot rolled sheets—(Coils or cut lengths)	33,529,170
Coils for cold reduced black plate and tin plate	9,385,300
Hot rolled strip	3,227,560
Bars—Light shapes	1,087,100
" —Concrete reinforcement	2,527,550
" —All other	14,027,520
Wire rods	7,374,850
Skelp	5,732,900
Blanks, tube rounds or pierced billets for seamless tubes	5,423,200
Wheels and axles—(Rolled)	488,500
Blooms and billets for forging or export	965,380
All other—Hot rolled	373,500
TOTAL	103,622,230
TOTAL STEEL INGOT CAPACITY	133,459,150
PERCENT TO INGOT CAPACITY	77.6%

Companies:	Annual Capacity Net Tons
Acme Steel Company	590,000
Acme-Newport Steel Company	441,000
TOTAL	1,031,000
Alan Wood Steel Company	533,000
Alco Products, Inc.	25,000
Allegheny Ludlum Steel Corporation	716,600
American Chain & Cable Company, Inc.	68,500
American Compressed Steel Corporation	12,000
Ames & Company, Inc., W.	30,000
Armco Steel Corporation	2,807,100
Sheffield Division	1,607,000
TOTAL	4,414,100
Atlantic Steel Company	320,000
Babcock & Wilcox Company	138,000
Baldwin-Lima-Hamilton Corporation	116,000
Barium Steel Corporation:	
Phoenix Iron & Steel Company	547,000
Berkman Company, Louis:	
Superior Sheet Steel Division	140,000
Parkersburg Steel Company	36,000
Ohio River Steel Division	136,080
TOTAL	312,080
Bethlehem Steel Corporation:	
Bethlehem Steel Company	15,119,000
Bethlehem Pacific Coast Steel Corporation	780,000
TOTAL	15,899,000
Borg-Warner Corporation	265,000
Braeburn Alloy Steel Corporation	3,200
Buffalo Bolt Company	65,600
Buffalo Steel Corporation	80,000
Byers Company, A. M.	*40,000
Carpenter Steel Company	54,000
Colorado Fuel and Iron Corporation	1,882,500
Roebling's Sons Corporation, John A.	177,000
TOTAL	2,059,500
Columbia Tool Steel Company	1,800
Continental Steel Corporation	355,000
Copperweld Steel Company	508,000
Crucible Steel Company of America	1,023,700
Detroit Steel Corporation	1,100,000
Driver Company, Wilbur B.	6,000
Eastern Stainless Steel Corporation	36,000
Edgewater Steel Company	94,000
Empire Steel Corporation	360,000
Falls Hollow Staybolt Company	8,000

* Does not include hot rolled wrought iron products, annual capacity 330,000 tons.

	Annual Capacity Net Tons
Firth Sterling, Inc.	16,600
Ford Motor Company	1,437,450
Granite City Steel Company	979,000
Green River Steel Corporation	150,000
Harsco Corporation:	
Harrisburg Steel Company	125,000
Heppenstall Company:	
Midvale-Heppenstall Company	30,000
Highland Iron & Steel, Inc.	27,000
Hoster Steel Corporation	15,000
Inland Steel Company	4,490,000
International Harvester Company	799,000
Jersey Shore Steel Company	40,000
Jessop Steel Company	21,000
Jones & Laughlin Steel Corporation	5,210,000
Joslyn Manufacturing & Supply Company	28,000
Judson Steel Corporation	54,000
Kaiser Steel Corporation	1,158,000
Keystone Steel & Wire Company	322,000
Knoxville Iron Company	90,000
Laclede Steel Company	444,000
Latrobe Steel Company	6,500
Le Tourneau Inc., R. G.	85,500
Lockhart Iron and Steel Company	68,000
Lone Star Steel Company	500,000
Lukens Steel Company	636,000
McLouth Steel Corporation	1,154,810
Mahoning Valley Steel Company	120,000
Merritt-Chapman & Scott Corporation:	
Milton Steel Division	80,000
Mississippi Steel Corporation	45,000
Missouri Rolling Mill Corporation	70,000
National Steel Corporation:	
Great Lakes Steel Corporation	2,624,000
Weirton Steel Company	2,615,000
TOTAL	5,239,000
National Supply Company	484,000
Northeastern Steel Corporation	231,400
Northern Steel, Inc.	15,000
Northwest Steel Rolling Mills, Inc.	42,000
Northwestern Steel & Wire Company	1,467,000
Oregon Steel Mills	125,000
Pacific States Steel Corporation	144,000
Pacific Steel Rolling Mills, Inc.	5,000
Phoenix Manufacturing Company	145,000
Pittsburgh Steel Company	1,154,000
Pollak Steel Company	100,000
Poor & Company, Inc.	12,000
Porter Company Inc., H. K.	243,000
Republic Steel Corporation	8,285,000
Roanoke Electric Steel Corporation (a)	20,000
Rotary Electric Steel Company	137,200
Sharon Steel Corporation	1,102,000
Simmons Company	36,000
Simonds Saw and Steel Company	18,200
Southern Electric Steel Company	60,000
Southwest Steel Rolling Mill Corp. (a)	40,000
Superior Steel Corporation	115,000
Sweet's Steel Company	104,000
Texas Steel Company	62,050
Timken Roller Bearing Company	455,500
Tredegar Company	38,500
United States Steel Corporation:	
American Steel and Wire Division	2,793,460
Columbia—Geneva Steel Division	2,064,400
National Tube Division	2,934,100
Tennessee Coal and Iron Division	2,824,550
United States Steel Corp. (Central Operations)	17,677,400
TOTAL	28,293,910
Universal-Cyclops Steel Corporation	66,200
Vanadium-Alloys Steel Company	10,000
Colonial Steel Company	32,330
TOTAL	42,330
Washburn Wire Company	65,000
Western Rolling Mills, Inc.	18,000
Wheeling Steel Corporation	1,856,000
Wickwire Brothers, Inc.	30,000
Youngstown Sheet and Tube Company	4,935,000
GRAND TOTAL	103,622,230

(a) Not described in this Directory.

By Plant Location and Operating Company

Plant Location and Operating Company:	Annual Capacity Net Tons
Alabama (Southern District)	
Bessemer	
Tennessee Coal & Iron Division	97,680
Birmingham	
Porter Co., Inc., H. K.:	
Connors Steel Div.	136,000
Southern Electric Steel Corp.	60,000
Ensley	
Tennessee Coal & Iron Division	255,200
Fairfield	
Tennessee Coal & Iron Division	2,471,670
Gadsden	
Republic Steel Corporation	625,000
TOTAL	3,645,550
California (Western District)	
Emeryville	
Judson Steel Corporation	54,000
Fontana	
Kaiser Steel Corporation	1,158,000
Los Angeles	
Bethlehem Pacific Coast Steel Corp.	356,000
(a) Southwest Steel Rolling Mills	40,000
Niles	
Pacific States Steel Corp.	144,000
Pittsburg	
Columbia-Geneva Steel Division	304,000
San Francisco	
Simmons Company	12,000
San Jose	
Western Rolling Mills, Inc.	18,000
South San Francisco	
Bethlehem Pacific Coast Steel Corp.	225,000
Torrance	
Columbia-Geneva Steel Division	189,000
TOTAL	2,500,000
Colorado (Western District)	
Pueblo	
Colorado Fuel & Iron Corp.	1,348,500
Connecticut (Eastern District)	
Bridgeport	
Northeastern Steel Corp.	231,400
Delaware (Eastern District)	
Claymont	
Colorado Fuel & Iron Corp.	300,000
Georgia (Southern District)	
Atlanta	
Atlantic Steel Company	320,000

(a) Not described in this Directory.

Hot-Rolled Steel Capacity by Plant Location and Operating Company (continued)

	Annual Capacity Net Tons
Illinois (Chicago District)	
Alton	
Laclede Steel Company	299,000
Chicago	
Acme Steel Company	590,000
Borg-Warner Corp.:	
Ingersoll Products Div.	80,000
International Harvester Co.	799,000
Republic Steel Corporation	910,000
United States Steel Corp. (Central Operations)	1,962,000
Chicago Heights	
Borg-Warner Corp.:	
Calumet Steel Div.	80,000
Columbia Tool Steel Co.	1,800
Inland Steel Company	90,000
Granite City	
Granite City Steel Co.	979,000
Joliet	
American Steel & Wire Division	903,320
Phoenix Manufacturing Co.	145,000
Madison	
Laclede Steel Company	145,000
Peoria	
Keystone Steel & Wire Co.	322,000
Sterling	
Northwestern Steel & Wire Co.	1,467,000
TOTAL	8,773,120
Indiana (Chicago District)	
East Chicago	
Inland Steel Company	4,400,000
Youngstown Sheet and Tube Co.	2,514,000
Fort Wayne	
Joslyn Mfg. & Supply Co.	28,000
Gary	
United States Steel Corp. (Central Operations)	6,077,000
Kokomo	
Continental Steel Corp.	355,000
New Castle	
Borg-Warner Corp.:	
Ingersoll Steel Div.	35,000
Terre Haute	
Highland Iron & Steel, Inc.	27,000
TOTAL	13,436,000
Kentucky (Pittsburgh-Youngstown District)	
Ashland	
Armco Steel Corporation	768,000
Newport	
Acme-Newport Steel Co.	441,000
Owensboro	
Green River Steel Corp.	150,000
TOTAL	1,359,000
Maryland (Eastern District)	
Baltimore	
Armco Steel Corporation	51,600
Eastern Stainless Steel Corp.	36,000
Sparrows Point	
Bethlehem Steel Company	5,782,000
TOTAL	5,869,600
Massachusetts (Eastern District)	
Medford	
Northern Steel, Inc.	15,000
Worcester	
American Steel & Wire Division	305,180
TOTAL	320,180
Michigan (Cleveland-Detroit District)	
Dearborn	
Ford Motor Company	1,457,450
Ecorse	
Great Lakes Steel Corp.	2,624,000
Trenton	
McLouth Steel Corporation	1,154,810
Warren	
Rotary Electric Steel Co.	137,200
TOTAL	5,373,460
Minnesota (Chicago District)	
Duluth	
American Steel & Wire Division	298,600
Mississippi (Southern District)	
Flowood	
Mississippi Steel Corporation	45,000
Missouri (Chicago District)	
Kansas City	
Armco Steel Corporation:	
Sheffield Division	585,000
St. Louis	
Missouri Rolling Mill Corp.	70,000
TOTAL	655,000
New Jersey (Eastern District)	
Jersey City	
Ames & Company, Inc. W.	30,000
Newark	
Driver Company, Wilbur B.	6,000
Roebling	
Roebling's Sons Corp., J. A.:	
Colorado Fuel & Iron Corp.	177,000
TOTAL	213,000
New York (Eastern District)	
Buffalo	
Republic Steel Corporation	650,000
Cortland	
Wickwire Brothers, Inc.	30,000
Dunkirk	
Allegheny Ludlum Steel Corp.	33,900
Lackawanna	
Bethlehem Steel Company	4,411,000
Lockport	
Simonds Saw & Steel Co.	18,200
North Tonawanda	
Buffalo Bolt Co. Div.:	
Buffalo Eclipse Corp.	65,600
Syracuse	
Crucible Steel Company of America	65,900
Tonawanda	
Colorado Fuel & Iron Corp.	234,000
Buffalo Steel Corp.	80,000
Troy	
Poor & Co., Inc.	12,000
Watervliet	
Allegheny Ludlum Steel Corp.	57,700
TOTAL	5,658,300

	Annual Capacity Net Tons
Ohio (Pittsburgh-Youngstown District)	
Campbell	
Youngstown Sheet and Tube Co.	1,881,000
Canton	
Republic Steel Corporation	750,000
Berkman Co., Louis:	
Superior Sheet Steel Div.	140,000
Timken Roller Bearing Co.	448,000
Cincinnati	
American Compressed Steel Corp.	12,000
Cuyahoga Falls	
Falls Hollow Staybolt Co.	8,000
Gambrinus	
Timken Roller Bearing Co.	7,500
Lowellville	
Sharon Steel Corporation	56,000
Mansfield	
Empire Steel Corporation	360,000
Marion	
Pollak Steel Company	100,000
Massillon	
Republic Steel Corporation	370,000
Middletown	
Armco Steel Corporation	1,590,000
Niles	
Mahoning Valley Steel Co.	120,000
Portsmouth	
Detroit Steel Corporation	1,100,000
Steubenville	
Wheeling Steel Corporation	849,000
Toronto	
Berkman Co., Louis:	
Ohio River Steel Div.	136,080
Warren	
Copperweld Steel Company	453,000
Republic Steel Corporation	1,190,000
Yorkville	
Wheeling Steel Corporation	501,000
Youngstown	
Republic Steel Corporation	1,385,000
United States Steel Corp. (Central Operations)	2,032,000
Youngstown Sheet and Tube Co.	540,000
Zanesville	
Armco Steel Corporation	108,000
Sub Total (Pittsburgh-Youngstown District)	14,136,580
Ohio (Cleveland-Detroit District)	
Cleveland	
American Steel & Wire Division	596,260
Jones & Laughlin Steel Corp.	1,145,000
Republic Steel Corporation	2,365,000
Elyria	
Republic Steel Corporation	40,000
Lorain	
National Tube Division	1,522,600
Sub Total (Cleveland-Detroit District)	5,668,860
TOTAL—Ohio	19,805,440
Oklahoma (Southern District)	
Oklahoma City	
Hoster Steel Corporation	15,000
Sand Springs	
Armco Steel Corporation:	
Sheffield Division	90,000
TOTAL	105,000
Oregon (Western District)	
Portland	
Oregon Steel Mills	125,000
Pennsylvania (Pittsburgh-Youngstown District)	
Aliquippa	
Jones & Laughlin Steel Corp.	1,793,000
Porter Co., Inc., H. K.:	
Vulcan Crucible Div.	3,000
Allenport	
Pittsburgh Steel Company	948,000
Ambridge	
National Supply Company	484,000
Beaver Falls	
Babcock & Wilcox Company	138,000
Brackenridge	
Allegheny Ludlum Steel Corp.	525,000
Braddock	
United States Steel Corp. (Central Operations)	214,700
Braeburn	
Braeburn Alloy Steel Corp.	3,200
Bridgeville	
Universal-Cyclops Steel Corp.	53,400
Butler	
Armco Steel Corporation	289,500
Carnegie	
Superior Steel Corporation	115,000
Clairton	
United States Steel Corp. (Central Operations)	495,700
Donora	
American Steel & Wire Division	690,100
Dravosburg	
United States Steel Corp. (Central Operations)	2,419,000
Duquesne	
United States Steel Corp. (Central Operations)	608,000
Ellwood	
National Tube Division	271,900
Farrell	
Sharon Steel Corporation	1,046,000
Franklin	
Borg-Warner Corp.:	
Franklin Steel Div.	70,000
Glassport	
Copperweld Steel Company	55,000
Harmony Township	
Byers Company, A. M.	40,000
Latrobe	
Alco Products, Inc.	25,000
Latrobe Steel Company	6,500
Vanadium-Alloys Steel Co.	10,000
McKeesport	
Firth Sterling, Inc.	16,600
National Tube Division	764,400
McKees Rocks	
Lockhart Iron & Steel Co.	60,000
Midland	
Crucible Steel Company of America	846,500
Monaca	
Vanadium-Alloys Steel Co.:	
Colonial Steel Company	32,330

	Annual Capacity Net Tons
Pennsylvania (Pittsburgh-Youngstown District) (Continued)	
Monessen	
American Chain & Cable Co.:	
Page Steel & Wire Div.	68,500
Pittsburgh Steel Company	206,000
Munhall	
United States Steel Corp. (Central Operations)	2,321,000
Oakmont	
Edgewater Steel Company	94,000
Pittsburgh	
Crucible Steel Company of America	111,300
Jones & Laughlin Steel Corp.	2,272,000
Washington	
Jessop Steel Company	21,000
West Leechburg	
Allegheny Ludlum Steel Corp.	100,000
Sub Total (Pittsburgh-Youngstown District)	17,217,630
Pennsylvania (Eastern District)	
Bethlehem	
Bethlehem Steel Company	2,724,000
Burnham	
Baldwin-Lima-Hamilton Corp.:	
Standard Steel Works Div.	116,000
Coatesville	
Lukens Steel Company	636,000
Fairless Hills	
United States Steel Corp. (Central Operations)	1,548,000
National Tube Division	375,200
Harrisburg	
Harsco Corporation:	
Harrisburg Steel Co. Divn.	125,000
Barium Steel Corp.:	
Phoenix Iron & Steel Co.	288,000
Ivy Rock	
Alan Wood Steel Company	533,000
Jersey Shore	
Jersey Shore Steel Co.	40,000
Johnstown	
Bethlehem Steel Company	1,604,000
Lebanon	
Bethlehem Steel Company	196,000
Milton	
Merritt-Chapman & Scott Corp.:	
Milton Steel Products Div.	80,000
Philadelphia	
Midvale-Heppenstall Co.	30,000
Phoenixville	
Barium Steel Corp.	
Phoenix Iron Steel Co.	259,000
Reading	
Carpenter Steel Company	54,000
Steelton	
Bethlehem Steel Company	402,000
Titusville	
Universal-Cyclops Steel Corp.	12,800
Williamsport	
Sweet's Steel Company	104,000
Sub Total (Eastern District)	9,127,000
TOTAL (Pennsylvania)	26,344,630
Rhode Island (Eastern District)	
Phillipsdale	
Washburn Wire Company	65,000
Tennessee (Southern District)	
Knoxville	
Knoxville Iron Company	90,000
Texas (Southern District)	
Fort Worth	
Texas Steel Company	62,050
Houston	
Armco Steel Corporation Sheffield Division	932,000
Lone Star	
Lone Star Steel Co.	500,000
Longview	
LeTourneau, Inc., R. G.	85,500
TOTAL	1,579,550
Utah (Western District)	
Geneva	
Columbia-Geneva Steel Division	1,571,400
Virginia (Southern District)	
Richmond	
Tredegar Company	38,500
Roanoke	
(a) Roanoke Electric Steel Corp.	20,000
TOTAL	58,500
Washington (Western District)	
Seattle	
Bethlehem Pacific Coast Steel Corp.	199,000
Northwest Steel Rolling Mills, Inc.	42,000
Pacific Steel Rolling Mills, Inc.	5,000
TOTAL	246,000
West Virginia (Pittsburgh-Youngstown District)	
Beech Bottom	
Wheeling Steel Corporation	30,000
Benwood	
Wheeling Steel Corporation	476,000
Huntington	
Porter Co., Inc., H. K.:	
Conners Steel Div.	104,000
Parkersburg	
Berkman Co., Louis:	
Parkersburg Steel Co. Div.	36,000
Weirton	
Weirton Steel Company	2,615,000
TOTAL	3,261,000
Wisconsin (Chicago District)	
Kenosha	
Simmons Company	24,000
Distribution by Districts:	
Eastern	21,784,480
Pittsburgh-Youngstown	35,974,210
Cleveland-Detroit	11,042,320
Chicago	23,186,720
Southern	5,843,600
Western	5,790,900
TOTAL	103,622,230

(a) Not described in this Directory.

Structural Shapes, Steel Piling (Rolled) and Plates

	ANNUAL CAPACITY (N. T.)			
	Structural Shapes (Heavy)	Steel Piling (Rolled)	Plates	
			Sheared	Universal
Companies:				
Acme Steel Company:				
Acme-Newport Steel Company	....	....	....	81,000
Alan Wood Steel Company	....	....	183,000	....
Armco Steel Corporation	....	....	180,000	....
Sheffield Division	103,400	....	463,000	....
TOTAL	103,400	....	643,000	....
Atlantic Steel Company	28,000	....	....	....
Barium Steel Corporation:				
Phoenix Iron & Steel Company	259,000	....	182,400	105,600
Bethlehem Steel Corporation:				
Bethlehem Steel Company	2,718,000	288,000	876,000	354,000
Bethlehem Pacific Coast Steel Corporation	158,000	....	....	18,000
TOTAL	2,876,000	288,000	876,000	372,000
Borg-Warner Corporation	....	....	10,000	....
Byers Company, A. M.	....	....	*9,000	*8,000
Colorado Fuel and Iron Corporation	60,000	....	307,000	....
Crucible Steel Company of America	....	....	....	26,600
Eastern Stainless Steel Corporation	....	....	6,000	....
Empire Steel Corporation	....	....	....	30,000
Granite City Steel Co.	....	....	220,000	....
Inland Steel Company	470,000	5,000	575,000	85,000
International Harvester Company	45,000	....	....	57,000
Jessop Steel Company	....	....	9,300	....
Jones & Laughlin Steel Corporation	110,000	....	247,000	12,000
Kaiser Steel Corporation	66,000	....	163,000	15,000
Le Tourneau Company, Inc., R. G.	....	....	85,500	....
Lone Star Steel Company	....	....	50,000	....
Lukens Steel Company	....	....	636,000	....
National Steel Corporation:				
Weirton Steel Company	200,000	....	....	....
Northwestern Steel & Wire Company	864,000	....	(a)	(a)
Oregon Steel Mills	16,500	....	....	....
Pacific States Steel Corporation	32,000	....	....	....
Porter Company, Inc., H. K.	7,000	....	....	....
Republic Steel Corporation	....	....	30,000	....
Sharon Steel Corporation	....	....	....	156,000
Simonds Saw and Steel Company	....	....	600	....
United States Steel Corporation:				
Columbia-Geneva Steel Division	137,400	....	584,500	....
Tennessee Coal and Iron Division	187,300	....	447,600	21,600
United States Steel Corp. (Central Operations)	2,154,800	106,000	2,365,000	340,700
TOTAL	2,479,500	106,000	3,397,100	362,300
Universal-Cyclops Steel Corporation	....	....	17,100	....
Wheeling Steel Corporation	....	....	180,000	....
Youngstown Sheet and Tube Company	12,000	....	90,000	....
GRAND TOTAL	7,628,400	399,000	7,917,000	1,310,500

(a) Included with structural shapes.
*Does not include wrought iron plates, annual capacity 21,000 tons sheared and 62,000 tons universal mill.

Hot-Rolled Sheets

	Annual capacity (N. T.)
Companies:	
Acme Steel Company:	
Acme-Newport Steel Company	360,000
Alan Wood Steel Company	(a)
Allegheny Ludlum Steel Corporation	525,000
Armco Steel Corporation	2,506,000
Berkman Company, Louis:	
Superior Sheet Steel Division	140,000
Parkersburg Steel Company	36,000
TOTAL	176,000
Bethlehem Steel Corporation:	
Bethlehem Steel Company	5,105,000
Borg-Warner Corporation	105,000
Byers Company, A. M.	*15,000
Continental Steel Corporation	55,000
Crucible Steel Company of America	122,100
Detroit Steel Corporation	900,000
Eastern Stainless Steel Corporation	30,000
Empire Steel Corporation	330,000
Ford Motor Company	1,376,560
Granite City Steel Company	675,000
Inland Steel Company	2,100,000
International Harvester Company	7,000
Jessop Steel Company	5,000
Jones & Laughlin Steel Corporation	1,936,000
Kaiser Steel Corporation	176,000
McLouth Steel Corporation	(b)1,154,810
Mahoning Valley Steel Company	120,000
National Steel Corporation:	
Great Lakes Steel Corporation	2,540,000
Weirton Steel Company	(c)
TOTAL	2,540,000
Pittsburgh Steel Company	586,000
Republic Steel Corporation	2,205,000
Sharon Steel Corporation	412,000
Simonds Saw and Steel Company	10,200
United States Steel Corporation:	
Columbia—Geneva Steel Division	524,000
Tennessee Coal and Iron Division	707,000
United States Steel Corp. (Central Operations)	5,873,000
TOTAL	7,104,000
Universal-Cyclops Steel Corporation	13,100
Vanadium-Alloys Steel Company:	
Colonial Steel Company	2,400
Wheeling Steel Corporation	499,000
Youngstown Sheet and Tube Company	2,178,000
GRAND TOTAL	33,529,170

(a) Included with hot rolled strip.
(b) Includes hot rolled strip.
(c) Included with coils for cold reduced black plate and tin plate.
* Does not include wrought iron sheets and strip, annual capacity 45,000 tons.

Coils for Cold-Reduced Black Plate and Tin Plate

	Annual capacity (N. T.)
Companies:	
Bethlehem Steel Corporation:	
Bethlehem Steel Company	1,325,000
Granite City Steel Company	84,000
Inland Steel Company	360,000
Jones & Laughlin Steel Corporation	644,000
Kaiser Steel Corporation	256,000
National Steel Corporation:	
Weirton Steel Company	(b)2,415,000
Republic Steel Corporation	300,000
United States Steel Corporation:	
Columbia-Geneva Steel Division	375,000
Tennessee Coal and Iron Division	663,300
United States Steel Corp. (Central Operations)	1,906,000
TOTAL	2,944,300
Wheeling Steel Corporation	501,000
Youngstown Sheet and Tube Company	456,000
GRAND TOTAL	9,285,300

(b) Includes capacity of hot rolled sheets.

Rails, Long Joint or Splice Bars and Tie Plate Bars and Wheels and Axles (Rolled)

	ANNUAL CAPACITY (N. T.)			
	Rails		Long joint or splice bars and tie plate bars	Wheels and Axles (Rolled)
	Standard (over 60 lbs. per yard)	60 lbs. or less per yard		
Companies:				
Armco Steel Corporation	....	....	....	69,500
Baldwin-Lima-Hamilton Corporation	....	....	....	66,000
Bethlehem Steel Corporation:				
Bethlehem Steel Company	312,000	6,000	122,000	152,000
Bethlehem Pacific Coast Steel Corporation	....	....	9,000	....
TOTAL	312,000	6,000	131,000	152,000
Colorado Fuel and Iron Corporation	350,000	8,000	120,000	....
Edgewater Steel Company	....	....	....	62,000
Inland Steel Company	135,000	....	50,000	....
Poor & Company	....	....	12,000	....
Porter Company, Inc., H. K.	....	10,000	....	....
Sweet's Steel Company	....	57,000	(a)	....
Tredegar Company	....	....	20,000	....
United States Steel Corporation:				
Columbia-Geneva Steel Division	....	....	27,100	....
Tennessee Coal and Iron Division	252,000	4,300	94,500	....
United States Steel Corp. (Central Operations)	549,500	21,400	165,000	139,000
TOTAL	801,500	25,700	286,600	139,000
GRAND TOTAL	1,598,500	106,700	619,600	488,500

(a) Included in capacity of hot rolled bars.

Blooms and Billets

	Annual capacity (N. T.)
Companies:	
Allegheny Ludlum Steel Corporation	3,300
Berkman Company, Louis:	
Ohio River Steel Division	136,080
Bethlehem Steel Corporation:	
Bethlehem Steel Company	372,000
Colorado Fuel and Iron Corporation	1,000
Green River Steel Corporation	125,000
Harsco Corporation:	
Harrisburg Steel Company	125,000
Inland Steel Company	25,000
International Harvester Company	72,000
Joslyn Manufacturing & Supply Company	6,000
Northeastern Steel Corporation	65,000
Oregon Steel Mills	13,000
Sharon Steel Corporation	20,000
GRAND TOTAL	963,380

Skelp

	Annual capacity (N. T.)
Companies:	
Bethlehem Steel Corporation:	
Bethlehem Steel Company	527,000
Byers Company, A. M.	(a) 3,000
Jones & Laughlin Steel Corporation	500,000
Kaiser Steel Corporation	353,000
Laclede Steel Company	63,000
Lone Star Steel Company	(b) 450,000
Republic Steel Corporation	1,265,000
United States Steel Corporation:	
National Tube Division	752,900
United States Steel Corp. (Central Operations)	359,000
TOTAL	1,111,900
Wheeling Steel Corporation	476,000
Youngstown Sheet and Tube Company	984,000
GRAND TOTAL	5,732,900

(a) Does not include wrought iron skelp, annual capacity 157,000 tons.
(b) Includes hot rolled strip.

Sheets (Cold Rolled, Galvanized and Long Terne)

	ANNUAL CAPACITY (N. T.)		
	Cold rolled sheets	Galvanized sheets	Long terne sheets
Companies:			
Acme Steel Company:			
Acme-Newport Steel Company	....	30,000	....
Alan Wood Steel Company	240,000	....	....
Allegheny Ludlum Steel Corporation	291,200	....	....
Armco Steel Corporation	1,696,000	631,000	60,000
Berkman Company, Louis	....	114,000	27,500
Bethlehem Steel Corporation:			
Bethlehem Steel Company	2,712,000	360,000	....
Continental Steel Corporation	....	120,000	....
Crucible Steel Company of America	37,300	....	....
Detroit Steel Corporation	420,000	....	....
Eastern Stainless Steel Corporation	30,000	....	....
Empire Steel Corporation	300,000	....	18,000
Follansbee Steel Corporation	100,000	....	31,200
Ford Motor Company	872,120	....	....
Granite City Steel Company	238,000	214,000	....
Inland Steel Company	850,000	250,000	....
Jones & Laughlin Steel Corporation	1,168,000	91,600	....
McLouth Steel Corporation	412,800	....	....
National Steel Corporation:			
Great Lakes Steel Corporation	2,220,000	....	....
Weirton Steel Company	750,000	408,000	30,000
TOTAL	2,970,000	408,000	30,000
Pittsburgh Steel Company	410,000	....	....
Republic Steel Corporation	1,650,000	350,000	....
United States Steel Corporation:			
Columbia-Geneva Steel Division	287,460	133,340	....
Tennessee Coal and Iron Division	389,700	253,500	....
United States Steel Corp. (Central Operation)	2,200,000	416,800	49,800
TOTAL	2,877,160	803,640	49,800
Washington Steel Corporation	36,000	....	....
Wheeling Steel Corporation	600,000	384,000	50,000
Youngstown Sheet and Tube Company	1,392,000	....	....
GRAND TOTAL	19,302,580	3,756,240	266,500

Hot-Dipped Tin and Terne Plate and Electrolytic Tin Plate

	ANNUAL CAPACITY (N. T.)		
	Hot dipped tin and terne plate	Electrolytic tin plate	Total
Companies:			
Bethlehem Steel Corporation:			
Bethlehem Steel Company	120,000	840,000	960,000
Crown Cork & Seal Company, Inc.	....	155,000	155,000
Granite City Steel Company	....	83,000	83,000
Inland Steel Company	....	235,000	235,000
Jones & Laughlin Steel Corporation	112,000	412,000	524,000
Kaiser Steel Corporation	70,000	205,000	275,000
National Steel Corporation:			
Weirton Steel Company	347,800	1,035,000	1,382,800
Republic Steel Corporation	....	180,000	180,000
United States Steel Corporation:			
Columbia-Geneva Steel Division	123,010	285,460	408,470
Tennessee Coal and Iron Division	244,100	440,400	684,500
United States Steel Corp. (Central Operations)	547,500	1,010,400	1,557,900
TOTAL	914,610	1,736,260	2,650,870
Wheeling Steel Corporation	31,200	234,000	265,200
Youngstown Sheet and Tube Company	168,000	408,000	576,000
GRAND TOTAL	1,763,610	5,523,260	7,286,870

Splice Bars, Other Rail Joints, Tie Plates, and Track Spikes

	ANNUAL CAPACITY (N. T.)		
	Splice Bars and Other Rail Joints	Tie Plates	Track Spikes
Companies:			
Ames & Company, Inc., W.	....	....	18,000
Armco Steel Corporation:			
Sheffield Division	....	....	24,000
Bethlehem Steel Corporation:			
Bethlehem Steel Company	26,400	87,600	24,000
Bethlehem Pacific Coast Steel Corporation	....	9,000	4,000
TOTAL	26,400	96,600	28,000
Colorado Fuel & Iron Corporation	50,000	150,000	20,000
Inland Steel Company	20,000	40,000	24,000
Jones & Laughlin Steel Corporation	....	....	36,000
Republic Steel Corporation	....	....	35,000
Tredegar Company	....	....	6,000
United States Steel Corporation:			
American Steel and Wire Division	136,150	....	....
Columbia-Geneva Steel Division	....	41,000	....
Tennessee Coal and Iron Division	62,900	150,200	30,000
United States Steel Corp. (Central Operations)	51,500	148,500	....
TOTAL	250,550	339,700	30,000
Youngstown Sheet and Tube Company	....	....	28,800
GRAND TOTAL	346,950	626,300	249,800

Strip (Cold Rolled and Galvanized)

	ANNUAL CAPACITY (N. T.)	
	Colled rolled strip	Galvanized strip
Companies:		
Acme Steel Company	355,140	124,000
Alan Wood Steel Company	(a)	....
Allegheny Ludlum Steel Corporation	170,000	....
Wallingford Steel Company	75,000	....
TOTAL	245,000	....
American Shim Steel Company	36,000	....
Atlantic Steel Company	....	13,000
Blair Strip Steel Company	52,000	....
Buffalo Bolt Company	2,500	....
Calstrip Steel Corporation	30,000	....
Carpenter Steel Company	12,090	....
Cleveland Cold Rolling Mills Company	240	....
Cold Metal Products Company	100,000	18,000
Colorado Fuel and Iron Corporation:		
Roebling's Sons Corporation, John A.	34,500	9,500
Crucible Steel Company of America	55,900	....
Detroit Steel Corporation	222,000	....
Driver Company, Wilbur B.	1,000	....
Elco Steel Products Co.	36,000	....
Empire Steel Corporation	(a)	....
Firth Sterling, Inc.	500	....
Follansbee Steel Corporation	150,000	....
Greer Steel Company	87,000	12,000
Griffin Manufacturing Company	27,000	....
Hind Steel Company, Inc.	5,000	....
Hofmann Industries Inc.	24,000	....
Igoe Brothers Inc.	1,000	....
Inland Steel Company	(a)	....
Jones & Laughlin Steel Corporation	(a)	....
Kaiser Steel Corporation	31,000	....
McLouth Steel Corporation	95,900	....
Mill Strip Products Company	38,000	....
National-Standard Company	9,200	....
National Steel Corporation:		
Weirton Steel Company	60,000	....
Newman-Crosby Steel Corporation	29,000	....
Pittsburgh Steel Company	120,000	22,000
Porter Company, Inc., H. K.	2,900	....
Precision Steel Corporation	4,500	....
Republic Steel Corporation	225,000	130,000
Rhode Island Steel Corporation	3,000	....
Rodney Metals, Inc.	20,000	....
Rome Strip Steel Company, Inc.	40,000	....
Sharon Steel Corporation	223,000	73,000
Simonds Saw & Steel Company	500	....
Stanley Works	95,000	....
Superior Steel Corporation	80,000	....
Thompson Wire Company	120,000	....
United States Steel Corporation:		
American Steel and Wire Division	214,410	22,530
Universal-Cyclops Steel Corporation	15,000	....
Wallace Barnes Company	22,500	....
Washburn Wire Company	23,100	....
Washington Steel Corporation	(a)	....
GRAND TOTAL	2,948,880	424,030

(a) Included with cold rolled sheets.

How Hot-Rolled Product Capacities Have Changed

The steel industry is expanding, but not all of its finishing capacities are growing. Some have decreased.

Here are the changes in hot-rolled steel product capacities in the last three years:

	Increases (Net tons)	Decreases (Net tons)
Rails—Standard, over 60 lb per yard	.....	408,500
Rails—60 lb or less per yard	.....	5,300
Long joint or splice bars and tie plate bars	.....	192,910
Structural shapes—Heavy	2,063,130	.....
Steel piling—Rolled	149,600	.....
Plates—Sheared	461,710	.....
Plates—Universal	119,505	.....
Hot-rolled sheets	2,025,125	.....
Coils for cold-reduced black plate and tin plate	2,583,400	.....
Hot-rolled strip	.....	1,950,000
Bars—Light shapes	451,475	.....
Bars—Concrete reinforcement	589,070	.....
Bars—All other	.....	148,630
Wire rods	373,475	.....
Skelp	102,000	.....
Blanks, tube rounds or pierced billets for seamless tubes	478,100	.....
Wheels and axles—Rolled	31,800	.....
Blooms and billets for forging or export	264,720	.....
All other—Hot-rolled	13,220	.....

Hot-Rolled Strip

	Annual Capacity (N. T.)
Companies:	
Acme Steel Company	590,000
Alan Wood Steel Company	350,000
Allegheny Ludlum Steel Corporation	100,000
Armco Steel Corporation	(a)
Atlantic Steel Company	66,000
Bethlehem Steel Company	(a)
Buffalo Bolt Company	600
Byers Company, A. M.	(a)
Carpenter Steel Company	10,400
Colorado Fuel and Iron Corporation	2,500
Roebling's Sons Company (John A.)	12,000
TOTAL	14,500
Crucible Steel Company of America	(a)
Detroit Steel Corporation	(a)
Empire Steel Corporation	(a)
Firth Sterling, Inc.	3,600
Inland Steel Company	20,000
International Harvester Company	22,000
Jones and Laughlin Steel Corporation	1,000
Kaiser Steel Corporation	35,000
Knoxville Iron Company	1,500
Laclede Steel Company	72,500
Lone Star Steel Company	(c)
McLouth Steel Corporation	(a)
National Steel Corporation:	
Great Lakes Steel Corporation	(a)
Porter Company Inc., H. K.	1,600
Republic Steel Corporation	610,000
Sharon Steel Corporation	514,000
Simonds Saw and Steel Company	800
Superior Steel Corporation	115,000
United States Steel Corporation:	
American Steel and Wire Division	133,760
Columbia—Geneva Steel Division	(b) 11,900
Tennessee Coal and Iron Division	57,400
United States Steel Corp. (Central Operations)	446,000
TOTAL	649,060
Washburn Wire Company	38,000
Youngstown Sheet and Tube Company	12,000
GRAND TOTAL	3,227,560

(a) Included in capacity of hot rolled sheets.
(b) Also see capacity of hot rolled sheets.
(c) Included in capacity of skelp.

Blanks, Tube Rounds or Pierced Billets for Seamless Tubes

	Annual capacity (N. T.)
Companies:	
Babcock & Wilcox Company	138,000
Bethlehem Steel Corporation:	
Bethlehem Steel Company	12,000
Colorado Fuel and Iron Corporation	300,000
Copperweld Steel Company	50,000
Inland Steel Company	5,000
Jones & Laughlin Steel Corporation	600,000
National Supply Company	484,000
Pittsburgh Steel Company	362,000
Republic Steel Corporation	310,000
Timken Roller Bearing Company	302,000
United States Steel Corporation:	
National Tube Division	2,181,200
United States Steel Corp. (Central Operations)	139,000
TOTAL	2,320,200
Youngstown Sheet and Tube Company	540,000
GRAND TOTAL	5,423,200

All Other Hot-Rolled Products

	Annual capacity (N. T.)
Companies:	
Alco Products, Inc.	25,000
Armco Steel Corporation:	
Sheffield Division	61,600
Baldwin-Lima-Hamilton Corporation	50,000
Bethlehem Steel Company	24,000
Borg-Warner Corporation	42,000
Colorado Fuel and Iron Corporation	75,000
Edgewater Steel Company	32,000
Firth Sterling, Inc.	6,000
Heppenstall Company:	
Midvale Heppenstall Company	30,000
Jones & Laughlin Steel Corporation	22,000
Porter Company, Inc., H. K.	2,000
Universal-Cyclops Steel Corporation	3,900
GRAND TOTAL	373,500

Pipe and Tubing

	ANNUAL CAPACITY (N. T.)					
	Buttweld	Lapweld	Seamless	Electric-weld	Spiral-weld	Gasweld
Companies:						
A P Parts Corporation	....	....	....	20,000	....	....
Allegheny Ludlum Steel Corporation	....	....	2,400	....	....	....
Wallingford Steel Company	....	....	....	....	....	1,300
TOTAL	....	....	2,400	....	....	1,300
Acme-Newport Steel Co. (Acme Steel Company)	....	....	....	95,000	....	....
American Metal Products Company	....	....	....	32,000	....	....
American Pipe & Steel Corporation	....	....	....	13,000	....	....
Armco Steel Corporation	....	....	....	35,000	120,000	....
Avon Tube Division, Higbie Manufacturing Company	....	....	....	7,000	....	....
Babcock & Wilcox Company	....	....	276,000	60,000	....	....
Berger Machine Parts, Inc.	....	....	....	10,000	....	....
Bethlehem Steel Company	360,000	....	....	240,000	....	....
Bundy Tubing Company	....	....	....	12,000	....	27,500
Byers Company, A. M.	47,000	90,000	....	....	....	....
Cal-Metal Pipe Corp. of La.	....	....	....	96,000	....	....
Central Steel Tube Company	....	....	....	13,500	....	....
Colorado Fuel and Iron Corporation	....	....	240,000	150,000	....	....
Columbia Steel & Shafting Company	....	....	7,500	....	....	....
Copperweld Steel Company	....	....	43,000	8,400	....	....
Damascus Tube Company	....	....	....	1,250	....	....
Electroweld Steel Corporation	....	....	....	7,200	....	....
Formed Tubes, Inc.	....	....	....	7,200	....	....
Fretz-Moon Tube Co., Inc.	70,000	....	....	....	....	....
Gaychrome Company	....	....	....	6,000	....	....
Harris Tube, Inc.	....	....	....	5,000	....	....
Hofmann Industries, Inc.	....	....	....	15,000	....	....
Ivins Steel Tube Works, Inc.	....	....	2,000	....	....	....
Jones & Laughlin Steel Corporation	190,000	120,000	480,000	45,000	....	....
Kaiser Steel Corporation	135,000	....	....	628,000	....	....
Kane Boiler Works, Inc.	....	....	....	24,000	....	....
Laclede Steel Company	60,000	....	....	24,000	....	5,000
Lone Star Steel Company	....	....	....	360,000	....	....
Mahoning Valley Steel Company	....	....	....	24,000	....	....
Mark & Company, Clayton	....	....	....	32,000	....	....
Master Tank & Welding, Ltd.	....	....	....	100,000	....	....
Michigan Seamless Tube Co.	....	....	32,000	....	....	....
Monroe Auto Equipment Company	....	....	....	6,000	....	....
National Supply Company	250,000	60,000	395,000	7,200	....	....
Naylor Pipe Company	....	....	....	....	24,000	....
Nikoh Tube Company	....	....	....	100,000	....	....
Pacific Tube Company	....	....	15,000	8,000	....	....
Phoenix Iron & Steel Co. (Barium Steel Corp.)	....	....	75,000	....	....	....
Pittsburgh Steel Company	....	....	250,000	....	....	....
Pittsburgh Tube Company	47,000	....	....	....	....	....
Republic Steel Corporation	360,000	....	276,000	872,000	....	....
Rome Manufacturing Company	....	....	....	18,000	....	....
Sawhill Tubular Products, Inc.	100,000	....	....	60,000	....	....
Service Steel Division	2,500	....	1,500	....	....	....
Sharon Steel Corporation	....	....	....	61,700	....	....
Sharon Tube Company	48,000	....	....	....	....	....
Shwayder Brothers, Inc.	....	....	....	10,000	....	....
Smith Corporation, A. O.	....	....	....	620,000	....	....
Smith Corp. of Texas, A. O.	....	....	....	480,000	....	....
Simmons Company	3,100	....	....	....	....	....
Southeastern Metals Co., Inc.	....	....	....	20,000	....	....
Southern Pipe & Casing Company	....	....	....	60,000	....	....
Standard Tube Company	....	....	....	85,000	....	....
State Canvas & Frame	....	....	....	3,900	....	....
Superior Tube Company	....	....	2,200	450	....	....
Taylor Forge & Pipe Works	....	....	....	12,000	120,000	....
Timken Roller Bearing Company	....	....	257,000	....	....	....
Toledo Steel Tube Company	....	....	....	11,000	....	....
Trent Tube Co. (Crucible Steel Co. of America)	....	....	....	4,000	....	....
Tube Reducing Corporation	....	....	50,000	....	....	....
Union Steel Corporation	....	....	....	2,000	....	....
United States Steel Corporation:						
American Bridge Division	....	....	....	350,000	....	....
Consolidated Western Steel Division	....	....	....	296,000	....	....
National Tube Division	910,000	....	2,017,130	291,640	....	....
TOTAL	910,000	....	2,017,130	937,640	....	....
United Tube Corp. of Ohio	....	....	....	15,000	....	....
Van Huffel Tube Corporation	....	....	....	84,000	....	....
Walker Manufacturing Company	....	....	....	18,000	....	....
Wheatland Tube Company	120,000	....	....	24,000	....	....
Wheeling Steel Corporation	360,000	....	....	....	....	....
Williams Manufacturing Company	....	....	....	2,000	....	....
Youngstown Sheet & Tube Co.	528,000	....	456,000	348,000	....	....
TOTAL	3,590,600	270,000	4,877,730	5,940,440	264,000	33,800

Changes in Product Capacities in the Last Three Years

(Other than hot-rolled products)

	Increases (Net tons)	Decreases (Net tons)
Cold-finished bars	248,505	.....
Pipe and tubing		
Buttweld	203,500	.....
Lapweld	.....	348,000
Seamless	229,600	.....
Electricweld	453,400	.....
Spiralweld	93,000	.....
Gasweld	300	.....
Wire and wire products		
Plain wire	453,480	.....
Galvanized wire	.....	7,070
Nails and staples	27,530	.....
Barbed wire	38,735	.....
Wire and wire products (continued)		
Woven fence	11,390	.....
Reinforcing fabric and netting	21,280	.....
Bale ties	.....	100,640
Cold-rolled sheets	2,313,900	.....
Galvanized sheets	444,620	.....
Long terne sheets	.....	22,100
Hot-dipped tin and terne plate	.....	985,070
Electrolytic tin plate	1,048,210	.....
Cold-rolled strip	.....	354,400
Galvanized strip	.....	12,700
Splice bars and other rail joints	.....	15,300
Tie plates	.....	56,070
Track spikes	Unchanged	

Hot-Rolled Bars

	ANNUAL CAPACITY (N. T.)		
	Bars		
	Light Shapes	Concrete Reinforcement	All Other
Companies:			
Allegheny Ludlum Steel Corporation	1,300	....	74,000
American Compressed Steel Company	....	12,000	....
Ames & Company, W.	....	....	30,000
Armco Steel Corporation	27,500	....	....
Sheffield Division	134,500	289,000	177,000
TOTAL	162,000	289,000	177,000
Atlantic Steel Company	40,000	50,000	50,000
Bethlehem Steel Corporation:			
Bethlehem Steel Company	132,000	402,000	1,672,000
Bethlehem Pacific Coast Steel Corporation	55,000	216,000	242,000
TOTAL	187,000	618,000	1,914,000
Borg-Warner Corporation	66,000	27,000	15,000
Braeburn Alloy Steel Corporation	....	....	3,200
Buffalo Bolt Company	....	....	40,500
Buffalo Steel Corporation	....	25,000	55,000
Byers Company, A. M.	....	....	*5,000
Carpenter Steel Company	....	....	30,000
Colorado Fuel and Iron Corporation	20,000	70,000	60,000
Columbia Tool Steel Company	....	....	1,800
Copperweld Steel Company	....	....	403,000
Crucible Steel Company of America	....	....	862,000
Falls Hollow Staybolt Company	....	....	8,000
Firth Sterling, Inc.	....	....	5,000
Ford Motor Company	....	....	80,890
Green River Steel Corporation	....	....	25,000
Highland Iron & Steel, Inc.	....	....	27,000
Hoster Steel Corporation	....	....	(b) 15,000
Inland Steel Company	125,000	100,000	435,000
International Harvester Company	33,000	....	563,000
Jersey Shore Steel Company	....	(a)	40,000
Jessop Steel Company	....	....	6,700
Jones & Laughlin Steel Corporation	150,000	72,000	568,000
Joslyn Manufacturing & Supply Company	....	....	18,000
Judson Steel Corporation	....	40,000	14,000
Kaiser Steel Corporation	....	8,500	86,000
Knoxville Iron Company	13,900	23,100	51,500
Laclede Steel Company	32,000	114,000	37,500
Latrobe Steel Company	....	....	6,500
Lockhart Iron and Steel Company	....	....	60,000
Merritt-Chapman & Scott Corporation	....	80,000	....
Mississippi Steel Corporation	15,000	30,000	....
Missouri Rolling Mill Corporation	....	53,500	16,500
National Steel Corporation:			
Great Lakes Steel Corporation	....	12,000	72,000
Northeastern Steel Corporation	....	....	166,400
Northern Steel, Inc.	....	15,000	....
Northwest Steel Rolling Mills, Inc.	....	30,000	12,000
Northwestern Steel & Wire Company	....	....	(c) 288,000
Oregon Steel Mills	5,500	75,000	13,000
Pacific States Steel Corporation	16,000	70,000	26,000
Pacific Steel Rolling Mills, Inc.	....	....	5,000
Phoenix Manufacturing Company	....	20,000	125,000
Pollak Steel Company	30,000	50,000	20,000
Porter Company, Inc., H. K.	129,400	68,000	25,000
Republic Steel Corporation	....	(b)	3,215,000
Roanoke Electric Steel Corporation (d)	....	....	20,000
Rotary Electric Steel Company	....	....	137,200
Simmons Company	(a)	3,000	33,000
Simonds Saw and Steel Company	....	....	6,600
Southern Electric Steel Company	15,000	30,000	15,000
Southwest Steel Rolling Mill Corporation (d)	....	20,000	20,000
Sweet's Steel Company	....	(c)	47,000
Texas Steel Company	....	57,050	5,000
Timken Roller Bearing Company	....	....	153,500
Tredegar Company	....	3,500	15,000
United States Steel Corporation:			
American Steel and Wire Division	....	....	133,850
Columbia-Geneva Steel Division	28,000	100,800	59,700
Tennessee Coal and Iron Division	....	101,600	151,850
United States Steel Corp. (Central Operations)	(a)	229,000	2,884,000
TOTAL	28,000	431,400	3,229,400
Universal-Cyclops Steel Corporation	....	....	20,400
Vanadium-Alloys Steel Company	....	....	10,000
Colonial Steel Company	....	....	29,930
TOTAL	....	....	39,930
Western Rolling Mills, Inc.	....	15,000	3,000
Youngstown Sheet and Tube Company	18,000	6,000	531,000
GRAND TOTAL	1,087,100	2,527,550	14,027,520

(a) Included in capacity of bars—all other.
(b) Includes light shapes.
(c) Includes concrete reinforcement.

(a) Included in capacity of bars—all other.
(b) Includes concrete reinforcement bars and tube rounds.
(c) Includes splice bars, tie plates and rerolled concrete reinforcement bars.
(d) Not described in this Directory.
* Does not include wrought iron bars, annual capacity 45,000 tons.

Cold-Finished Bars

	Annual capacity (N. T.)
Companies:	
Allegheny Ludlum Steel Corporation	*28,600
Anchor Drawn Steel Company (Vanadium-Alloys Steel Co.)	3,000
Armco Steel Corporation	21,000
Atlantic Wire Company	1,200
Bethlehem Steel Company	75,000
Blim & Laughlin, Inc.	495,000
Buffalo Bolt Company, Division (Buffalo Eclipse Corp.)	3,200
Carpenter Steel Company	27,000
Columbia Steel & Shafting Company	135,000
Compressed Steel Shafting Company	20,000
Copperweld Steel Company	55,100
Crucible Steel Company of America	169,400
Cumberland Steel Company	50,000
Cuyahoga Steel & Wire Company	25,000
Eaton Manufacturing Company (Reliance Division)	27,000
Firth Sterling, Inc.	2,800
Fitzsimons Steel Company	50,000
Fort Howard Steel & Wire, Division (Research Parts & Engr. Corp.)	20,000
International Harvester Company	55,900
Jones & Laughlin Steel Corporation	348,000
Joslyn Manufacturing & Supply Company	25,000
Keystone Drawn Steel Company	40,000
Kidd Drawn Steel Company	4,300
La Salle Steel Company	310,000
Latrobe Steel Company	1,500
Moltrup Steel Products Company	72,000
Nelsen Steel & Wire Company	37,500
Northeastern Steel Corporation	70,000
Pacific Tube Company	20,000
Pilgrim Drawn Steel Division (Automotive Mat'ls Corp.)	139,000
Pittsburgh Tool Steel Wire Co. (Vanadium-Alloys Steel Co.)	7,400
Plymouth Steel Corporation	38,000
Precision Drawn Steel Company	77,000
Republic Steel Corporation	509,000
Rotary Electric Steel Company	120,300
Sierra-Drawn Steel Corporation	33,600
Southeastern Metals Co., Inc.	60,000
Superior Drawn Steel Company	36,000
Timken Roller Bearing Company	125,000
United States Steel Corporation:	
American Steel and Wire Company	56,030
United States Steel Corp. (Central Operations)	7,900
TOTAL	63,930
Universal-Cyclops Steel Company	7,350
Western Automatic Machine Screw Company	52,500
Wyckoff Steel Company	458,200
Youngstown Sheet and Tube Company	90,000
TOTAL	4,009,780

* Includes capacity of drawn wire.

Wire Rods

	Annual capacity (N. T.)
Companies:	
Allegheny Ludlum Steel Corporation	13,000
American Chain & Cable Company, Inc.	68,500
Armco Steel Corporation	24,100
Sheffield Division	376,500
TOTAL	402,600
Atlantic Steel Company	76,000
Bethlehem Steel Corporation:	
Bethlehem Steel Company	720,000
Bethlehem Pacific Coast Steel Corporation	82,000
TOTAL	802,000
Buffalo Bolt Company	24,500
Carpenter Steel Company	13,600
Colorado Fuel and Iron Corporation	509,000
Roebling's Sons Corporation (John A.)	165,000
TOTAL	674,000
Continental Steel Corporation	300,000
Copperweld Steel Company	55,000
Crucible Steel Company of America	13,000
Detroit Steel Corporation	200,000
Driver Company, Wilbur B.	6,000
Firth Sterling, Inc.	2,000
Jones & Laughlin Steel Corporation	348,000
Joslyn Manufacturing & Supply Company	4,000
Keystone Steel & Wire Company	322,000
Laclede Steel Company	125,000
Northwestern Steel & Wire Company	315,000
Pittsburgh Steel Company	206,000
Republic Steel Corporation	350,000
United States Steel Corporation:	
American Steel and Wire Division	2,525,850
Columbia-Geneva Steel Division	216,000
Tennessee Coal and Iron Division	136,100
TOTAL	2,877,950
Universal-Cyclops Steel Corporation	11,700
Washburn Wire Company	27,000
Wickwire Brothers, Inc.	30,000
Youngstown Sheet and Tube Company	108,000
GRAND TOTAL	7,374,850

Trends in Bar Capacities

(Net tons)

	Hot Rolled	Cold Finished
1957	14,027,520	4,009,780
1954	14,176,150	3,761,730
1951	11,977,810	2,968,395
1948	12,150,560	3,217,260

Wire and Wire Products

	ANNUAL CAPACITY (N. T.)						
	Plain wire	Galvanized wire	Nails and staples	Barbed wire	Woven fence	Reinforcing fabric and netting	Bale ties
Companies:							
Alan Wood Steel Co.	....	....	*4,900	....	....	....	....
American Chain & Cable Co., Inc.	92,000	18,000	....	600	....	....	....
Angell Nail & Chaplet Co.	22,000	....	18,000	....	....	....	....
Armco Steel Corporation	12,000	....	....	....	....	....	....
Sheffield Division	271,000	53,000	61,200	32,400	36,000	72,000	6,800
TOTAL	283,000	53,000	61,200	32,400	36,000	72,000	6,800
Atlantic Steel Company	87,600	31,000	43,000	13,000	35,000	....	6,000
Atlantic Wire Company	24,000	1,800	....	....	....	....	....
Atlas Tack Corporation	5,000	....	4,900	....	....	....	....
Behlen Manufacturing Co.	9,000	....	....	....	....	5,000	....
Bethlehem Steel Corporation:							
Bethlehem Steel Company	531,000	150,000	68,000	12,000	14,000	....	12,000
Bethlehem Pacific Coast Steel Corp.	60,000	12,000	....	....	....	....	....
TOTAL	591,000	162,000	68,000	12,000	14,000	....	12,000
Buffalo Bolt Company Division (Buffalo Eclipse Corporation)	24,000	....	....	....	....	....	....
Carpenter Steel Company	840	....	....	....	....	....	....
Cedarburg Wire, Nail & Screw Co.	1,200	....	1,200	....	....	....	....
Chicago Steel & Wire Co.	12,000	9,000	....	....	....	....	....
Colorado Fuel and Iron Corp.	559,070	84,800	55,500	60,000	40,600	119,600	3,700
Roebling's Sons Corp., John A.	150,000	25,000	....	....	....	....	....
TOTAL	709,070	109,800	55,500	60,000	40,600	119,600	3,700
Continental Steel Corp.	225,000	60,000	51,500	31,000	70,000	30,000	12,000
Copperweld Steel Company	55,000	....	....	....	....	7,500	....
Cuyahoga Steel & Wire Co.	20,000	....	....	....	....	....	....
Davis Wire & Cable Corp., K. H.	15,000	2,700	....	....	....	3,000	....
Detroit Steel Corporation	135,000	25,000	....	....	....	45,000	....
Driscoll Wire Company	7,800	....	....	....	....	....	....
Driver Company, Wilbur B.	3,000	....	....	....	....	....	....
Edward Company, E. H.	7,000	3,600	....	....	5,800	1,600	2,400
Enterprise Wire Company	22,000	2,000	....	....	....	....	....
Gilbert & Bennett Mfg. Co.	30,200	7,500	....	....	....	25,500	....
Igoe Brothers, Inc.	30,000	....	500	....	....	....	....
Jones & Laughlin Steel Corp.	315,000	68,000	66,000	36,000	14,000	....	....
Joslyn Mfg. & Supply Co.	6,000	....	....	....	....	....	....
Keystone Steel & Wire Co.	330,000	165,000	60,000	50,000	195,000	32,000	....
Mid-States Steel & Wire Co.	101,500	53,000	13,400	11,600	30,000	....	400
TOTAL	431,500	218,000	73,400	61,600	225,000	32,000	400
Laclede Steel Company	128,000	10,000	....	....	....	50,000	....
Macwhyte Company	9,300	700	....	....	....	....	....
Madison Wire Company, Inc.	6,000	....	....	....	....	....	....
Maryland Fine & Spec. Wire Co., Inc.	2,400	....	....	....	....	....	....
National-Standard Company	51,500	....	....	....	....	....	....
New England High Carbon Wire Co.	14,400	....	....	....	....	....	....
Nichols Wire & Aluminum Co.	63,700	6,200	11,200	3,800	8,100	....	....
Northeastern Steel Corporation	3,600	....	....	....	....	....	....
Northwestern Steel & Wire Co.	330,000	110,000	72,000	27,000	57,600	151,000	64,800
Pittsburgh Steel Company	324,000	100,000	45,500	20,000	160,000	....	....
Johnson Steel & Wire Co., Inc.	31,800	1,800	....	....	....	....	....
TOTAL	355,800	101,800	45,500	20,000	160,000	....	....
Porter Company, Inc., H. K.	7,500	....	....	....	....	....	....
Reed & Prince Manufacturing Co.	10,500	....	....	....	....	....	....
Reid-Avery Company, Inc.	16,000	....	....	....	....	....	....
Republic Steel Company	424,000	110,000	122,000	41,000	50,000	....	13,000
Seneca Wire & Mfg. Co.	19,000	1,000	....	....	....	....	....
Sherman Steel & Wire Co.	2,900	1,500	....	....	....	....	....
Smith Company, Ivy H.	12,000	....	....	....	....	12,000	....
Thompson Wire Company	12,000	....	....	....	....	....	....
Townsend Company	36,000	....	1,500	....	....	....	....
Union Wire Rope Corp.	66,000	....	....	....	....	....	....
United States Steel Corporation:							
American Steel & Wire Division	1,993,800	504,490	380,000	194,560	199,380	14,840	5,790
Columbia-Geneva Steel Division	140,850	30,050	58,780	4,230	6,320	1,380	3,470
Tennessee Coal and Iron Division	184,000	98,600	90,100	39,400	63,850	....	7,500
TOTAL	2,318,650	633,140	528,880	238,190	269,550	16,220	16,760
Universal-Cyclops Steel Corp.	6,000	....	....	....	....	....	....
Washburn Wire Company	14,700	....	....	....	....	....	....
Western Auto Machine Screw Co.	12,000	....	....	....	....	....	....
Wheeling Steel Corporation	....	....	*12,000	....	....	....	....
Wickwire Brothers, Inc.	12,000	3,000	5,300	....	....	5,000	....
Wilson Steel & Wire Co.	35,000	10,000	15,000	....	....	....	....
Wire Sales Company	16,000	1,000	2,000	....	....	....	....
Wright Steel & Wire Co., G. F.	15,000	6,000	....	....	....	3,000	....
Youngstown Sheet & Tube Co.	72,000	6,000	....	....	....	....	....
GRAND TOTAL	7,235,160	1,771,740	1,263,480	576,590	985,650	578,420	137,860

*Cut nails.

Company Names and Addresses

Acme Steel Co., 135th & Perry Ave.
Riverdale Station, Chicago 27, Ill.
Acme-Newport Steel Co.
Newport, Ky.
Alan Wood Steel Co.
Conshohocken, Pa.
Alberta Phoenix Tube & Pipe Ltd.
P.O. Box 4314
Edmonton, Alta., Canada
Alco Products Inc., 30 Church St.
New York, N.Y.
Algoma Steel Corp. Ltd.
Sault Ste. Marie, Ont., Canada
Allegheny Ludlum Steel Corp.
2020 Oliver Bldg.
Pittsburgh 22, Pa.

American Bridge Division
U.S. Steel Corp.
525 Wm. Penn Place
Pittsburgh 30, Pa.
American Chain & Cable Co. Inc.
230 Park Ave.
New York 17, N.Y.
American Compressed Steel Corp.
900 E. Front St.
Cincinnati 2, O.
American Metal Products Co.
5959 Linsdale Ave.
Detroit 4, Mich.
American Pipe & Steel Corp.
2201 W. Commonwealth Ave.
Alhambra, Calif.

American Shim Steel Co.
New Kensington, Pa.
American Steel & Wire Division
U.S. Steel Corp.
Rockefeller Bldg.
Cleveland 13, O.
Ames & Co. Inc., W.
417 Communipaw Ave.
Jersey City 4, N.J.
Anaconda Copper Mining Co.
25 Broadway, New York 4, N.Y.
Anchor Drawn Steel Co.
Latrobe, Pa.
Angell Nail & Chaplet Co.
4580 E. 71st St.
Cleveland 5, O.

AP Parts Corp., AP Bldg.
Toledo 1, O.
Armco Steel Corp., Middletown, O.
Atlantic Steel Co., P.O. Box 1714
Atlanta 1, Ga.
Atlantic Wire Co., 1 Church St.
Branford, Conn.
Atlas Steels Ltd.
Welland, Ont., Canada
Atlas Tack Corp.
Fairhaven, Mass.
Avon Tube Division
Higbie Mfg. Co.
Rochester, Mich.

Babcock & Wilcox Co.
Beaver Falls, Pa.
Baldwin-Lima-Hamilton Corp.
Burnham, Pa.
Barium Steel Corp., 25 Broad St.
New York, N.Y.
Barton Tubes Ltd.
Burlington, Ont., Canada
Behlen Mfg. Co. Inc.
Columbus, Nebr.
Berger Machine Products Inc.
74-16 Grand Ave.
Maspeth, N.Y.
Berkman Co., Louis
Steubenville, O.
Bethlehem Pacific Coast Steel Corp.
Bethlehem, Pa.
Bethlehem Steel Co.
Bethlehem, Pa.
Blair Strip Steel Co.
New Castle, Pa.
Bliss & Laughlin Inc., Harvey, Ill.
Borg-Warner Corp.
310 S. Michigan Ave.
Chicago 4, Ill.
Braeburn Alloy Steel Corp.
Braeburn, Pa.
Brainard Steel Division
Sharon Steel Corp.
Warren, O.
Buffalo Bolt Co., 101 East Ave.
North Tonawanda, N.Y.
Buffalo Steel Corp.
Tonawanda, N.Y.
Bundy Tubing Co.
8109 E. Jefferson Ave.
Detroit 14, Mich.
Burlington Steel Co. Ltd.
319 Sherman Ave. North
Hamilton, Ont., Canada
Byers Co., A. M.
Clark Bldg., 717 Liberty Ave.
Pittsburgh 30, Pa.

Cabot Shops Inc., P.O. Box 1101
Pampa, Tex.
Cal-Metal Pipe Corp. of Louisiana
P.O. Box 2548, Baton Rouge, La.
Calstrip Steel Corp.
7140 Bandini Blvd.
Los Angeles 22, Calif.
Cameron Iron Works Inc.
P.O. Box 1212
Houston 1, Tex.
Canadian Drawn Steel Co. Ltd.
Gerrard street
Hamilton, Ont., Canada
Canadian Furnace Co. Ltd.
503 Queen St. E.
Sault Ste. Marie, Ont., Canada
Canadian Steel Corp. Ltd.
1219 Walker Rd.
Walkerville, Ont., Canada
Canadian Tube & Steel Products Ltd.
5765 Hamilton St.
Montreal, Que., Canada
Canadian Western Pipe Mills Ltd.
Port Moody, B.C., Canada
Carpenter Steel Co., Reading, Pa.
Cedarburg Wire, Wire Nail & Screw Co., Cedarburg, Wis.
Central Steel Tube Co., Clinton, Iowa
Chicago Steel & Wire Co.
10257 Torrence Ave.
Chicago 17, Ill.
Chromium Mining & Smelting Corp.
13550 S. Indiana Ave.
Chicago 27, Ill.
Cleveland Cold Rolling Mills Co.
6813 Stroud Rd.
Cleveland 30, O.
Climax Molybdenum Co.
500 Fifth Ave.
New York 36, N.Y.
Cold Metal Products Co.
45 S. Montgomery Ave.
Youngstown 1, O.
Colonial Steel Co., Monaca, Pa.
Colorado Fuel & Iron Corp.
Continental Oil Bldg.
Denver 2, Colo.
Columbia-Geneva Steel Division
U.S. Steel Corp.
120 Montgomery St.
San Francisco 6, Calif.
Columbia Steel & Shafting Co.
P.O. Box 1557
Pittsburgh 30, Pa.

(Please turn to page 124)

Steel Ingots

THE U.S. has more steelmaking capacity than ever before.

On Jan. 1, 1957, the total was 133,459,150 net tons.

Three years ago, it was 124,330,410 net tons. The increase comes to 9,128,740 tons, or 7.3 per cent.

Improvement in steelmaking technology and an increase in furnace size are demonstrated by a 7,817,680 ton rise in open-hearth capacity despite a decrease in the number of such furnaces. We now have 921 open hearths, compared with 934 three years ago.

Capacity of electric steelmaking furnaces rose 1,053,060 tons in the three-year period. Twelve such furnaces were added.

The country now has 540,000 tons of oxygen converter steelmaking capacity in three converters at McLouth Steel Corp.'s Trenton, Mich., plant.

Steel Ingot Capacity by Type and Company

	OPEN HEARTH		BESSEMER		ELECTRIC AND CRUCIBLE		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Kinds:							
Open hearth—basic	886	116,092,520	....	.....	.....	.....	116,092,520
Open hearth—acid	35	819,890	....	.....	.....	.....	819,890
Oxygen Converter	....	.....	....	.....	3	540,000	540,000
Bessemer	.....	.....	(d) 33	4,505,000	.....	.....	4,505,000
Electric	.....	.....	.....	.....	267	11,501,700	11,501,700
Crucible	.....	.....	.....	.....	1	40	40
TOTAL	921	116,912,410	(d) 33	4,505,000	271	12,041,740	133,459,150
Companies:							
Acme-Newport Steel Co.	7	325,000	....	.....	3	283,000	608,000
Alan Wood Steel Co.	9	800,000	....	.....	.....	.....	800,000
Alco Products, Inc.	3	103,000	....	.....	1	2,160	105,160
Allegheny Ludlum Steel Corporation	5	312,000	....	.....	30	552,200	864,200
American Compressed Steel Corp.	.....	.....	.....	.....	1	21,600	21,600
Armco Steel Corporation	27	3,381,000	....	.....	9	469,000	3,850,000
Sheffield Division	.....	1,380,000	.....	.....	5	720,000	2,100,000
TOTAL	40	4,761,000	.....	.....	14	1,189,000	5,950,000
Atlantic Steel Company	3	124,000	....	.....	2	276,000	400,000
Babcock & Wilcox Company	.....	.....	.....	.....	4	229,450	229,450
Baldwin-Lima-Hamilton Corp.	5	169,920	.....	.....	(a) 1	40	169,960
Barium Steel Corporation:							
Industrial Forge & Steel Co.	2	48,600	....	.....	.....	.....	48,600
Phoenix Iron & Steel Co.	11	806,760	.....	.....	1	40,000	846,760
TOTAL	13	855,360	.....	.....	1	40,000	895,360
Berkman Company, Louis							
Ohio River Steel Div.	4	136,080	....	.....	.....	.....	136,080
Bethlehem Steel Corp.:							
Bethlehem Steel Co.	125	18,934,000	3	336,000	6	230,000	19,500,000
Bethlehem Pacific Coast Steel Corp.	10	522,000	.....	.....	3	478,000	1,000,000
TOTAL	135	19,456,000	3	336,000	9	708,000	20,500,000
Borg-Warner Corporation:							
Ingersoll Steel Div.	....	.....	....	.....	4	64,000	64,000
Ingersoll Products Div.	.....	.....	.....	.....	2	100,000	100,000
TOTAL	.....	.....	.....	.....	6	164,000	164,000
Braeburn Alloy Steel Corp.	....	.....	....	.....	2	20,730	20,730
Byers Company, A. M.	....	.....	....	.....	2	90,000	90,000
Cabot Shops, Inc.	....	.....	....	.....	1	14,500	14,500
Cameron Iron Works, Inc.	.....	.....	.....	.....	2	58,800	58,800
Carpenter Steel Company	.....	.....	.....	.....	6	86,600	86,600
Colorado Fuel & Iron Corp.	27	2,594,500	....	.....	....	.....	2,594,500
Roebling's Sons Corp., J. A.	9	235,000	....	.....	.....	.....	235,000
TOTAL	36	2,829,500	.....	.....	.....	.....	2,829,500
Columbia Tool Steel Co.	....	.....	....	.....	2	6,600	6,600
Continental Steel Corp.	5	420,000	....	.....	.....	.....	420,000
Copperweld Steel Co.	....	.....	....	.....	7	660,000	660,000
Crucible Steel Company of America	9	1,044,000	....	.....	17	379,400	1,423,400
Detroit Steel Corp.	15	1,500,000	....	.....	.....	.....	1,500,000
Eastern Stainless Steel Corp.	....	.....	....	.....	4	50,000	50,000
Edgewater Steel Co.	3	117,600	....	.....	.....	.....	117,600
Empire Steel Corporation	7	500,000	....	.....	....	.....	500,000
Erie Forge & Steel Corp.	5	234,000	....	.....	.....	.....	234,000
Finkl & Sons Co., A.	....	.....	....	.....	2	33,600	33,600
Firth Sterling Inc.	....	.....	....	.....	3	20,040	20,040
Ford Motor Company	10	1,677,150	....	.....	5	200,250	1,877,400
Granite City Steel Co.	7	1,200,000	....	.....	.....	.....	1,200,000
Green River Steel Corp.	....	.....	....	.....	2	183,190	183,190
Harrisburg Steel Co., Div. of Harsco Corp.	3	100,750	....	.....	.....	.....	100,750
Heppenstall Company	2	50,470	....	.....	1	5,080	55,550
Midvale-Heppenstall Co.	3	100,800	....	.....	3	62,550	163,350
Hooter Steel Corporation	....	.....	....	.....	1	12,000	12,000
Inland Steel Company	40	5,500,000	....	.....	.....	.....	5,500,000
International Harvester Company	11	1,200,000	....	.....	.....	.....	1,200,000
Isaacson Iron Works	....	.....	....	.....	2	102,000	102,000
Jessop Steel Company	....	.....	....	.....	4	35,740	35,740
Jones & Laughlin Steel Corporation	37	5,998,000	3	600,000	1	2,000	6,600,000

	OPEN HEARTH		BESSEMER		ELECTRIC AND CRUCIBLE		Total annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Companies *(Continued)*:							
Joslyn Mfg. & Supply Co.	....	.....	....	.....	3	37,500	37,500
Judson Steel Corporation	3	76,500	....	.....	....	.....	76,500
Kaiser Steel Corp.	9	1,536,000	....	.....	....	.....	1,536,000
Keystone Steel & Wire Co.	4	450,000	....	.....	....	.....	450,000
Kilby Steel Company	....	.....	....	.....	1	34,020	34,020
Knoxville Iron Company	....	.....	....	.....	2	38,000	38,000
Laclede Steel Company	4	500,000	....	.....	....	.....	500,000
Latrobe Steel Company	....	.....	....	.....	5	24,000	24,000
Le Tournesu, Inc., R. G.	....	.....	....	.....	3	83,100	83,100
Lone Star Steel Co.	4	550,000	....	.....	....	.....	550,000
Lukens Steel Company	12	750,000	....	.....	.....	.....	750,000
McLouth Steel Corporation	....	.....	....	.....	(f)9	(f)1,380,000	1,380,000
Merritt-Chapman & Scott Corp.:							
Milton Steel Prod. Div.	....	.....	....	.....	3	90,000	90,000
Mesta Machine Company	8	121,000	....	.....	1	20,000	141,000
Mississippi Steel Corp.	....	.....	....	.....	1	45,000	45,000
National Forge & Ordnance Company	....	.....	....	.....	3	25,000	25,000
National Steel Corp.:							
Great Lakes Steel Corp.	17	3,200,000	(b) 2	.....	....	.....	3,200,000
Weirton Steel Co.	14	3,000,000	(b) 2	.....	.....	.....	3,000,000
TOTAL	31	6,200,000	(b) 4	.....	....	.....	6,200,000
National Supply Co.	....	.....	....	.....	3	50,200	50,200
(g) Newport News Shipbuilding & Dry Dock Co.	....	.....	....	.....	3	12,000	12,000
Northeastern Steel Corp.	3	188,280	....	.....	2	114,920	303,200
Northwest Steel Rolling Mills, Inc.	....	.....	....	.....	2	48,600	48,600
Northwestern Steel & Wire Co.	....	.....	....	.....	5	825,000	825,000
Oregon Steel Mills	....	.....	....	.....	3	120,000	120,000
Pacific States Steel Corp.	3	216,000	....	.....	....	.....	216,000
Pittsburgh Steel Co.	12	1,320,000	....	.....	....	.....	1,320,000
Porter Co., Inc., H. K.:							
Connors Steel Div.	....	.....	....	.....	4	199,000	199,000
Vulcan Crucible Steel Co.	.....	.....	.....	.....	2	9,600	9,600
TOTAL	....	.....	....	.....	6	208,600	208,600
Republic Steel Corp.	78	8,840,000	2	665,000	26	1,542,000	11,047,000
(g) Roanoke Electric Steel Corp.	....	.....	....	.....	1	24,000	24,000
Rotary Electric Steel Co.	....	.....	....	.....	6	300,000	300,000
Sharon Steel Corp.	17	1,826,000	....	.....	2	72,000	1,898,000
Simonds Saw & Steel Co.	....	.....	....	.....	3	21,600	21,600
Southern Electric Steel Co.	....	.....	....	.....	2	66,000	66,000
(g) Southwest Steel Rolling Mills	....	.....	....	.....	1	45,000	45,000
Texas Steel Company	....	.....	....	.....	3	70,450	70,450
Timken Roller Bearing Company	....	.....	....	.....	9	700,000	700,000
Union Electric Steel Corp.	....	.....	....	.....	2	26,760	26,760
United States Steel Corp.:							
United States Steel Corp. (Central Operations)	177	24,949,000	(c) 8	1,284,000	9	387,000	26,620,000
American Steel & Wire Div.	26	2,275,000	....	.....	....	.....	2,275,000
Columbia-Geneva Steel Div.	19	2,679,000	....	.....	....	.....	2,679,000
National Tube Div.	15	3,021,000	6	990,000	....	.....	4,011,000
Tennessee Coal & Iron Div.	23	3,997,000	(b) 3	.....	.....	.....	3,997,000
TOTAL	260	36,921,000	17	2,274,000	9	387,000	39,582,000
Universal-Cyclops Steel Corporation	.....	.....	.....	.....	5	70,160	70,160
Vanadium-Alloys Steel Co.	....	.....	....	.....	4	12,000	12,000
Colonial Steel Co.	.....	.....	.....	.....	2	30,000	30,000
TOTAL	.....	.....	.....	.....	6	42,000	42,000
Washburn Wire Co.	4	93,000	....	.....	....	.....	93,000
Wheeling Steel Corp.	11	1,630,000	2	570,000	....	.....	2,200,000
Wickwire Brothers, Inc.	....	.....	....	.....	2	30,300	30,300
Youngstown Sheet and Tube Company	41	6,180,000	2	60,000	.....	.....	6,240,000
GRAND TOTAL	921	116,912,410	(d) 33	4,505,000	(ef)271	12,041,740	133,459,150

Steel Ingot Capacity by Plant Location and Operating Company

Plant Location and Operating Company:	OPEN HEARTH No.	OPEN HEARTH Annual capacity (N. T.)	BESSEMER No.	BESSEMER Annual capacity (N. T.)	ELECTRIC AND CRUCIBLE No.	ELECTRIC AND CRUCIBLE Annual capacity (N. T.)	Total annual capacity (N. T.)
Alabama (Southern District)							
Anniston							
Kilby Steel Co.	....	.....	....	.....	1	34,020	34,020
Birmingham							
Porter Co. Inc., H. K.:							
Connors Steel Div.	....	.....	....	.....	3	115,000	115,000
Southern Electric Steel Co.	....	.....	....	.....	2	66,000	66,000
Ensley							
Tennessee Coal & Iron Division	9	1,770,000	(b) 3	.....	....	.....	1,770,000
Fairfield							
Tennessee Coal & Iron Division	14	2,227,000	....	.....	....	.....	2,227,000
Gadsden							
Republic Steel Corp.	8	789,000	....	.....	....	.....	789,000
TOTAL	31	4,786,000	(b) 3	.....	6	215,020	5,001,020
California (Western District)							
Emeryville							
Judson Steel Corp.	3	76,500	....	.....	....	.....	76,500
Fontana							
Kaiser Steel Corp.	9	1,536,000	....	.....	....	.....	1,536,000
Los Angeles							
Bethlehem Pacific Coast Steel Corp.	....	.....	....	.....	3	478,000	478,000
Southwest Steel Rolling Mills	....	.....	....	.....	1	45,000	45,000
Niles							
Pacific States Steel Corp.	3	216,000	....	.....	....	.....	216,000
Pittsburg							
Columbia-Geneva Steel Div.	5	380,000	....	.....	....	.....	380,000
South San Francisco							
Bethlehem Pacific Coast Steel Corp.	5	276,000	....	.....	....	.....	276,000
Torrance							
Columbia-Geneva Steel Div.	4	222,000	....	.....	....	.....	222,000
National Supply Co.	....	.....	....	.....	3	50,200	50,200
TOTAL	29	2,706,500	....	.....	7	573,200	3,279,700
Colorado (Western District)							
Pueblo							
Colorado Fuel and Iron Corp.	17	1,800,000	....	.....	....	.....	1,800,000
Connecticut (Eastern District)							
Bridgeport							
Northeastern Steel Corp.	3	188,280	....	.....	2	114,920	303,200
Delaware (Eastern District)							
Claymont							
Colorado Fuel & Iron Corp.	7	499,500	....	.....	....	.....	499,500
Georgia (Southern District)							
Atlanta							
Atlantic Steel Co.	3	124,000	....	.....	2	276,000	400,000
Illinois (Chicago District)							
Alton							
Laclede Steel Co.	4	500,000	....	.....	....	.....	500,000
Chicago							
Finkl & Sons Co., A.	....	.....	....	.....	2	33,600	33,600
Borg-Warner Corp. Ingersoll Products Div.	....	.....	....	.....	2	100,000	100,000
International Harvester Company	11	1,200,000	....	.....	....	.....	1,200,000
Republic Steel Corp.	4	625,000	....	.....	9	767,000	1,392,000
United States Steel Corp. (Central Operations)	31	4,779,000	3	500,000	3	162,000	5,441,000
Chicago Heights							
Columbia Tool Steel Co.	....	.....	....	.....	2	6,600	6,600
Granite City							
Granite City Steel Co.	7	1,200,000	....	.....	....	.....	1,200,000
Peoria							
Keystone Steel & Wire Co.	4	450,000	....	.....	....	.....	450,000
Sterling							
Northwestern Steel & Wire Company	....	.....	....	.....	5	825,000	825,000
TOTAL	61	8,754,000	3	500,000	23	1,894,200	11,148,200
Indiana (Chicago District)							
East Chicago							
Inland Steel Company	40	5,500,000	....	.....	....	.....	5,500,000
Youngstown Sheet and Tube Company	17	3,144,000	....	.....	....	.....	3,144,000
Fort Wayne							
Joslyn Mfg. & Supply Company	....	.....	....	.....	3	37,500	37,500
Gary							
United States Steel Corp. (Central Operations)	55	7,204,000	(c) 3	.....	....	.....	7,204,000
Kokomo							
Continental Steel Corp.	5	420,000	....	.....	....	.....	420,000
New Castle							
Borg-Warner Corp. Ingersoll Steel Div.	....	.....	....	.....	4	64,000	64,000
TOTAL	117	16,268,000	(c) 3	.....	7	101,500	16,369,500
Kentucky (Pittsburgh - Youngstown District)							
Ashland							
Armco Steel Corporation.	8	952,000	....	.....	....	.....	952,000
Newport							
Acme-Newport Steel Co.	7	325,000	....	.....	3	283,000	608,000
Owensboro							
Green River Steel Corp.	....	.....	....	.....	2	183,190	183,190
TOTAL	15	1,277,000	....	.....	5	466,190	1,743,190
Maryland (Eastern District)							
Baltimore							
Armco Steel Corporation.	....	.....	....	.....	6	102,000	102,000
Eastern Stainless Steel Corp.	....	.....	....	.....	4	50,000	50,000
Sparrows Point							
Bethlehem Steel Co.	28	5,864,000	3	336,000	....	.....	6,200,000
TOTAL	28	5,864,000	3	336,000	10	152,000	6,352,000
Massachusetts (Eastern District)							
Worcester							
American Steel & Wire Division	4	287,000	....	.....	....	.....	287,000
Michigan (Cleveland - Detroit District)							
Dearborn							
Ford Motor Company	10	1,677,150	....	.....	5	200,250	1,877,400
Ecorse							
Great Lakes Steel Corp.	17	3,200,000	(b) 2	.....	....	.....	3,200,000
Ferndale							
Allegheny Ludlum Steel Corporation	....	.....	....	.....	5	3,000	3,000
Trenton							
McLouth Steel Corp.	....	.....	....	.....	(f)	9(f)1,380,000	1,380,000
Warren							
Rotary Electric Steel Company	....	.....	....	.....	6	300,000	300,000
TOTAL	37	4,877,150	(b) 2	.....	(f)	25(f)1,883,250	6,760,400
Minnesota (Chicago District)							
Duluth							
American Steel & Wire Division	9	973,000	....	.....	....	.....	973,000
Mississippi (Southern District)							
Flowood							
Mississippi Steel Corp.	....	.....	....	.....	1	45,000	45,000
Missouri (Chicago District)							
Kansas City							
Sheffield Division	5	480,000	....	.....	2	300,000	780,000
New Jersey (Eastern District)							
Harrison							
Crucible Steel Company of America	....	.....	....	.....	6	7,800	7,800
Roebling							
Roebling's Sons Corp., J. A.	9	235,000	....	.....	....	.....	235,000
TOTAL	9	235,000	....	.....	6	7,800	242,800
New York (Eastern District)							
Buffalo							
Republic Steel Corp.	9	882,000	....	.....	....	.....	882,000
Cortland							
Wickwire Brothers, Inc.	....	.....	....	.....	2	30,300	30,300
Dunkirk							
Allegheny Ludlum Steel Corporation	....	.....	....	.....	3	33,000	33,000
Lackawanna							
Bethlehem Steel Co.	35	5,720,000	....	.....	....	.....	5,720,000
Lockport							
Simonds Saw & Steel Co.	....	.....	....	.....	3	21,600	21,600
Syracuse							
Crucible Steel Company of America	....	.....	....	.....	6	59,600	59,600

(a) Crucible furnace.
(b) Used in melting charge for open hearth furnaces.
(c) Includes 3 converters used only in melting charge for open hearth furnaces.
(d) Includes 10 converters used only in melting charge for open hearth furnaces.
(e) Includes 1 crucible furnace, annual capacity, 40 tons.
(f) Includes 3 oxygen converters, annual capacity, 540,000 tons.
(g) Not described in this Directory.

Company Names and Addresses (Continued from page 122)

Columbia Tool Steel Co.
Lincoln Highway & State street
Chicago Heights, Ill.

Compressed Steel Shafting Co.
1587 Hyde Park Ave.
Readville, Mass.

Conners Steel Division
H. K. Porter Company Inc.
P.O. Box 2562, Birmingham, Ala.

Consolidated Western Steel Division
U.S. Steel Corp.
Box 2015 Terminal Annex
Los Angeles 54, Calif.

Continental Steel Corp.
Kokomo, Ind.

Copperweld Steel Co.
422 Frick Bldg.
Pittsburgh 19, Pa.

Crown Cork & Seal Co. Inc.
4425 Eastern Ave.
Baltimore 3, Md.

Crucible Steel Co. of America
535 Smithfield St.
Pittsburgh 30, Pa.

Cumberland Steel Co.
Cumberland, Md.

Cuyahoga Steel & Wire Co.
Longwood Ave.
Maple Heights, Cleveland 5, O.

Damascus Tube Co.
Greenville, Pa.

Davis Wire & Cable Corp., K. H.
2226 Santa Fe Ave.
Los Angeles 58, Calif.

Detroit Steel Corp.
1025 S. Oakwood Ave.
Detroit 9, Mich.

Dominion Foundries & Steel Ltd.
Depew St., Hamilton, Ont., Canada

Dominion Iron & Steel Ltd.
Sydney, N.S., Canada

Dominion Steel & Coal Corp. Ltd.
Canada Cement Bldg.
Montreal, Que., Canada

Donner-Hanna Coke Corp.
Abby & Mystic streets
Buffalo 20, N.Y.

Driscoll Wire Co., Shelton, Conn.

Driver Co., Wilbur B.
1875 McCarter Highway
Newark 4, N.J.

(Please turn to page 128)

N.Y. (Eastern District) (Continued)	OPEN HEARTH No.	OPEN HEARTH Annual capacity (N. T.)	BESSEMER No.	BESSEMER Annual capacity (N. T.)	ELECTRIC AND CRUCIBLE No.	ELECTRIC AND CRUCIBLE Annual capacity (N. T.)	Total annual capacity (N. T.)
Tonawanda							
Allegheny Ludlum Steel Corporation	....	.....	....	.....	2	4,500	4,500
Colorado Fuel & Iron Corp.	3	295,000	....	.....	....	.....	295,000
Watervliet							
Allegheny Ludlum Steel Corporation	....	.....	....	.....	7	77,000	77,000
TOTAL	47	6,897,000	....	.....	23	226,000	7,123,000
Ohio (Pittsburgh - Youngstown District)							
Campbell							
Youngstown Sheet and Tube Company	12	1,668,000	2	60,000	....	.....	1,728,000
Canton							
Industrial Forge & Steel Co.	2	48,600	....	.....	....	.....	48,600
Republic Steel Corp.	6	540,000	....	.....	17	775,000	1,315,000
Timken Roller Bearing Co.	....	.....	....	.....	9	700,000	700,000
Cincinnati							
American Compressed Steel Corp.	....	.....	....	.....	1	21,600	21,600
Lowellville							
Sharon Steel Corp.	5	521,000	....	.....	2	72,000	593,000
Mansfield							
Empire Steel Corp.	7	500,000	....	.....	....	.....	500,000
Massillon							
Republic Steel Corp.	9	620,000	....	.....	....	.....	620,000
Middletown							
Armco Steel Corp.	13	1,956,000	....	.....	1	293,000	2,249,000
Portsmouth							
Detroit Steel Corp.	15	1,500,000	....	.....	....	.....	1,500,000
Steubenville							
Wheeling Steel Corp.	11	1,630,000	2	570,000	....	.....	2,200,000
Toronto							
Louis Berkman Co., Ohio River Steel Div.	4	136,080	....	.....	....	.....	136,080
Warren							
Copperweld Steel Co.	....	.....	....	.....	7	660,000	660,000
Republic Steel Corp.	8	1,000,000	....	.....	....	.....	1,000,000
Youngstown							
Republic Steel Corp.	15	1,524,000	2	665,000	....	.....	2,189,000
United States Steel Corp. (Central Operations)	15	2,159,000	2	784,000	....	.....	2,943,000
Youngstown Sheet and Tube Co.	12	1,368,000	....	.....	....	.....	1,368,000
SubTotal (Pitts. - Youngs. Dist.)	134	15,170,680	8	2,079,000	38	2,521,600	19,771,280
Ohio (Cleveland - Detroit District)							
Cleveland							
Jones & Laughlin Steel Corp.	11	1,400,000	....	.....	....	.....	1,400,000
Republic Steel Corp.	19	2,860,000	....	.....	....	.....	2,860,000
Lorain							
National Tube Div.	12	1,695,000	3	870,000	....	.....	2,565,000
SubTotal (Clev.-Det. Dist.)	42	5,955,000	3	870,000	....	.....	6,825,000
TOTAL—Ohio	176	21,125,680	11	2,949,000	38	2,521,600	26,596,280
Oklahoma (Southern District)							
Oklahoma City							
Hoster Steel Corp.	....	.....	....	.....	1	12,000	12,000
Sand Springs							
Sheffield Division	....	.....	....	.....	1	120,000	120,000
TOTAL	....	.....	....	.....	2	132,000	132,000
Oregon (Western District)							
Portland							
Oregon Steel Mills	....	.....	....	.....	3	120,000	120,000
Pennsylvania (Pittsburgh - Youngstown District)							
Aliquippa							
Jones & Laughlin Steel Corp.	5	1,300,000	3	600,000	....	.....	1,900,000
Porter Co. Inc., H. K.: Vulcan Crucible Steel Co.	....	.....	....	.....	2	9,600	9,600
Beaver Falls							
Babcock & Wilcox Co.	....	.....	....	.....	4	229,450	229,450
Brackenridge							
Allegheny Ludlum Steel Corp.	5	312,000	....	.....	13	434,700	746,700
Braddock							
United States Steel Corp. (Central Operations)	16	2,179,000	....	.....	....	.....	2,179,000
Braeburn							
Braeburn Alloy Steel Corp.	....	.....	....	.....	1	20,730	20,730
Bridgeville							
Universal-Cyclops Steel Corp.	....	.....	....	.....	5	70,160	70,160
Butler							
Armco Steel Corporation	6	473,000	....	.....	1	74,000	547,000
Carnegie							
Union Electric Steel Corporation	....	.....	....	.....	2	26,760	26,760
Clairton							
United States Steel Corp. (Central Operations)	12	1,064,000	....	.....	....	.....	1,064,000
Donora							
American Steel & Wire Division	13	1,015,000	....	.....	....	.....	1,015,000
Duquesne							
United States Steel Corp. (Central Operations)	12	1,302,000	....	.....	4	219,000	1,521,000
Farrell							
Sharon Steel Corp.	12	1,305,000	....	.....	....	.....	1,305,000
Harmony Township							
Byers Company, A. M.	....	.....	....	.....	2	90,000	90,000
Latrobe							
Alco Products, Inc.	3	103,000	....	.....	1	2,160	105,160
Latrobe Steel Company	....	.....	....	.....	5	24,000	24,000
Vanadium-Alloys Steel Company	....	.....	....	.....	4	12,000	12,000
McKeesport							
Firth Sterling Inc.	....	.....	....	.....	3	20,040	20,040
National Tube Div.	3	1,326,000	3	120,000	....	.....	1,446,000
Midland							
Crucible Steel Company of America	9	1,044,000	....	.....	5	312,000	1,356,000
Monaca							
Colonial Steel Co.	....	.....	....	.....	2	30,000	30,000
Monessen							
Pittsburgh Steel Co.	12	1,320,000	....	.....	....	.....	1,320,000

	OPEN HEARTH No.	OPEN HEARTH Annual capacity (N. T.)	BESSEMER No.	BESSEMER Annual capacity (N. T.)	ELECTRIC AND CRUCIBLE No.	ELECTRIC AND CRUCIBLE Annual capacity (N. T.)	Total annual capacity (N. T.)
Pennsylvania (Pittsburgh - Youngstown District) (Continued)							
Munhall							
United States Steel Corp. (Central Operations)	25	4,043,000	....	.....	....	.....	4,043,000
New Castle							
Mesta Machine Co.	4	36,000	....	.....	....	.....	36,000
Oakmont							
Edgewater Steel Co.	3	117,600	....	.....	....	.....	117,600
Pittsburgh							
Heppenstall Company	2	50,470	....	.....	1	5,080	55,550
Jones & Laughlin Steel Corporation	21	3,298,000	....	.....	1	2,000	3,300,000
Washington							
Jessop Steel Company	....	.....	....	.....	4	35,740	35,740
West Homestead							
Mesta Machine Co.	4	85,000	....	.....	1	20,000	105,000
SubTotal (Pitts. - Youngs. Dist.)	167	20,373,070	6	720,000	62	1,637,420	22,730,490
Pennsylvania (Eastern District)							
Bethlehem							
Bethlehem Steel Co.	29	3,520,000	....	.....	6	230,000	3,750,000
Burnham							
Baldwin-Lima-Hamilton Corp.	5	169,920	....	.....	(a) 1	40	169,960
Coatesville							
Lukens Steel Company	12	750,000	....	.....	....	.....	750,000
Erie							
Erie Forge & Steel Corp.	5	234,000	....	.....	....	.....	234,000
Fairless Hills							
United States Steel Corp. (Central Operations)	9	2,200,000	....	.....	....	.....	2,200,000
Harrisburg							
Barium Steel Corp.: Phoenix Iron & Steel Co.	6	446,760	....	.....	1	40,000	486,760
Harrisburg Steel Co.	3	100,750	....	.....	....	.....	100,750
Irvine							
National Forge & Ordnance Company	....	.....	....	.....	3	25,000	25,000
Ivy Rock							
Alan Wood Steel Co.	9	800,000	....	.....	....	.....	800,000
Johnstown							
Bethlehem Steel Co.	21	2,330,000	....	.....	....	.....	2,330,000
United States Steel Corp. (Central Operations)	2	19,000	....	.....	2	6,000	25,000
Milton							
Milton Steel Products Div. Merritt-Chapman & Scott Corp.	....	.....	....	.....	3	90,000	90,000
Philadelphia							
Midvale-Heppenstall Co.	3	100,800	....	.....	3	62,550	163,350
Phoenixville							
Barium Steel Corp.: Phoenix Iron & Steel Co.	5	360,000	....	.....	....	.....	360,000
Reading							
Carpenter Steel Co.	....	.....	....	.....	6	86,600	86,600
Steelton							
Bethlehem Steel Co.	12	1,500,000	....	.....	....	.....	1,500,000
SubTotal (Eastern Dist.)	121	12,531,230	....	.....	25	540,190	13,071,420
TOTAL—Pennsylvania	288	32,904,300	6	720,000	(e) 87	2,177,610	35,801,910
Rhode Island (Eastern District)							
Phillipsdale							
Washburn Wire Co.	4	93,000	....	.....	....	.....	93,000
Tennessee (Southern District)							
Knoxville							
Knoxville Iron Co.	....	.....	....	.....	2	38,000	38,000
Texas (Southern District)							
Fort Worth							
Texas Steel Company	....	.....	....	.....	3	70,450	70,450
Houston							
Cameron Iron Works, Inc.	....	.....	....	.....	2	58,800	58,800
Sheffield Division	8	900,000	....	.....	2	300,000	1,200,000
Lone Star							
Lone Star Steel Company	4	550,000	....	.....	....	.....	550,000
Longview							
Le Tourneau, Inc., R. G.	....	.....	....	.....	3	83,100	83,100
Pampa							
Cabot Shops, Inc.	....	.....	....	.....	1	14,500	14,500
TOTAL	12	1,450,000	....	.....	11	526,850	1,976,850
Utah (Western District)							
Geneva							
Columbia-Geneva Steel Div.	10	2,077,000	....	.....	....	.....	2,077,000
Virginia (Southern District)							
Newport News							
Newport News Shipbuilding & Dry Dock Company	....	.....	....	.....	3	12,000	12,000
Roanoke							
Roanoke Electric Steel Corp.	....	.....	....	.....	1	24,000	24,000
TOTAL	....	.....	....	.....	4	36,000	36,000
Washington (Western District)							
Seattle							
Bethlehem Pacific Coast Steel Corp.	5	246,000	....	.....	....	.....	246,000
Isaacson Iron Works	....	.....	....	.....	2	102,000	102,000
Northwest Steel Rolling Mills, Inc.	....	.....	....	.....	2	48,600	48,600
TOTAL	5	246,000	....	.....	4	150,600	396,600
West Virginia (Pittsburgh - Youngstown District)							
Huntington							
Connors Steel Div.	....	.....	....	.....	1	84,000	84,000
Weirton							
Weirton Steel Co.	14	3,000,000	(b) 2	.....	....	.....	3,000,000
TOTAL	14	3,000,000	(b) 2	.....	1	84,000	3,084,000
DISTRIBUTION BY DISTRICTS:							
Eastern	223	26,595,010	3	336,000	66	1,040,910	27,971,920
Pittsburgh-Youngstown	330	39,820,750	16	2,799,000	106	4,709,210	47,328,960
Cleveland-Detroit	69	10,832,150	5	870,000	25	1,883,250	13,585,400
Chicago	192	26,475,000	6	500,000	32	2,295,700	29,270,700
Southern	46	6,360,000	(b) 3	.....	28	1,268,870	7,628,870
Western	61	6,829,500	....	.....	14	843,800	7,673,300
TOTAL	921	116,912,410	(d) 33	4,505,000	(e)271	12,041,740	133,459,150

Pig Iron

THE INCREASE in the size and productivity of this country's blast furnaces has boosted their total annual capacity 4,816,560 net tons in the last three years—a period in which only two furnaces were added.

On Jan. 1, 1957, a total of 262 stacks had an annual capacity of 86,817,950 net tons. Blast furnace capacity is now equal to 65 per cent of the country's steelmaking capacity, compared with 66 per cent three years ago.

Blast Furnace Capacity By Companies

	No. of stacks	Total annual capacity (N. T.)
Companies:		
Alan Wood Steel Company	2	454,800
Armco Steel Corporation	6	2,104,000
Sheffield Division	1	420,000
TOTAL	7	2,524,000
Barium Steel Corporation:		
Phoenix Iron and Steel Co.	1	200,000
Berkman Company, Louis	1	136,800
Bethlehem Steel Company	33	(a) 12,830,000
Colorado Fuel and Iron Corporation	7	1,425,040
Crucible Steel Company of America	3	895,000
Detroit Steel Corporation	2	768,700
Eastern Gas and Fuel Associates	1	195,000
Ford Motor Company	3	1,165,980
Granite City Steel Company	2	675,000
Inland Steel Company	8	3,011,200
Interlake Iron Corporation	7	1,630,000
International Harvester Company	3	808,000
Jackson Iron & Steel Company	1	95,000
Jones & Laughlin Steel Corporation	13	4,607,000
Kaiser Steel Corporation	3	1,314,000
Lavino & Company, E. J.	3	(b) 184,000
Lone Star Steel Company	1	385,000
McLouth Steel Corporation	1	483,500
Merritt-Chapman & Scott Corp.:		
Tennessee Products & Chemical Corp.	3	217,740
National Steel Corporation:		
Great Lakes Steel Corporation	4	2,120,000
Hanna Furnace Corporation	4	850,000
Weirton Steel Company	4	2,100,000
TOTAL	12	5,070,000
New Jersey Zinc Company	2	(c) 112,000
Pittsburgh Coke & Chemical Company	3	836,500
Pittsburgh Steel Company	2	980,000
Republic Steel Corporation	22	7,733,000
Sharon Steel Corporation	3	814,400
Shenango Furnace Company	2	445,450
Tonawanda Iron Division, American Radiator & Stand. Sanitary Corp.	1	165,000
United States Pipe & Foundry Co.	4	491,710
United States Steel Corporation:		
United States Steel Corp. (Central Operations)	53	(d) 19,410,300
American Steel & Wire Division	6	1,693,000
Columbia-Geneva Steel Division	5	1,804,200
National Tube Division	9	3,275,000
Tennessee Coal & Iron Division	9	(e) 3,209,000
TOTAL	82	(f) 29,391,500
Wheeling Steel Corporation	6	1,860,000
Woodward Iron Company	4	772,630
Youngstown Sheet & Tube Company	13	4,140,000
GRAND TOTAL	262	(g) 86,817,950

(a) Includes 216,000 tons ferroalloys capacity.
(b) Ferromanganese only.
(c) Spiegeleisen only.
(d) Includes 237,600 tons ferroalloys capacity.
(e) Includes 39,000 tons ferroalloys capacity.
(f) Includes 276,600 tons ferroalloys capacity.
(g) Includes 788,600 tons ferroalloys capacity.

Blast Furnace Capacity by Plant Location and Operating Company

	No. of stacks	Total annual capacity (N. T.)
Plant Location and Operating Company:		
Alabama (Southern District)		
Birmingham		
Republic Steel Corporation	2	402,000
United States Pipe & Foundry Co.	2	281,230
Ensley		
Tennessee Coal & Iron Division	6	(e) 1,898,300
Fairfield		
Tennessee Coal & Iron Division	3	1,310,700
Gadsden		
Republic Steel Corporation	2	525,000
North Birmingham		
United States Pipe & Foundry Co.	2	210,480
Woodward		
Woodward Iron Company	4	772,630
TOTAL	21	(e) 5,400,340
California (Western District)		
Fontana		
Kaiser Steel Corporation	3	1,314,000
Colorado (Western District)		
Pueblo		
Colorado Fuel and Iron Corporation	4	883,840
Illinois (Chicago District)		
Chicago		
Interlake Iron Corporation	2	587,000
International Harvester Company	3	808,000
Republic Steel Corporation	1	517,000
United States Steel Corp. (Central Operations)	11	4,196,700
Youngstown Sheet and Tube Company	3	834,000
Granite City		
Granite City Steel Co.	2	675,000
TOTAL	22	7,467,700
Indiana (Chicago District)		
East Chicago		
Inland Steel Company	8	3,011,200
Youngstown Sheet and Tube Company	3	1,296,000
Gary		
United States Steel Corp. (Central Operations)	12	4,782,600
TOTAL	23	9,089,800
Kentucky (Pittsburgh - Youngstown District)		
Ashland		
Armco Steel Corporation	3	902,000
Maryland (Eastern District)		
Sparrows Point		
Bethlehem Steel Company	9	4,272,000
Massachusetts (Eastern District)		
Everett		
Eastern Gas and Fuel Associates	1	195,000
Michigan (Cleveland - Detroit District)		
Dearborn		
Ford Motor Company	3	1,165,980
River Rouge		
Great Lakes Steel Corporation	4	2,120,000
Trenton		
McLouth Steel Corporation	1	483,500
TOTAL	8	3,769,480
Minnesota (Chicago District)		
Duluth		
American Steel & Wire Division	2	491,000
Interlake Iron Corporation	1	146,000
TOTAL	3	637,000
New York (Eastern District)		
Buffalo		
Hanna Furnace Corporation	4	850,000
Republic Steel Corporation	2	618,000
Lackawanna		
Bethlehem Steel Company	7	3,096,000
North Tonawanda		
Tonawanda Iron Division	1	165,000
Tonawanda		
Colorado Fuel & Iron Corporation	2	390,000
Troy		
Republic Steel Corporation	1	263,000
TOTAL	17	5,382,000
Ohio (Pittsburgh - Youngstown District)		
Campbell		
Youngstown Sheet and Tube Company	4	1,452,000
Canton		
Republic Steel Corporation	1	266,000
Hubbard		
Youngstown Sheet and Tube Company	1	204,000
Jackson		
Interlake Iron Corporation	1	75,000
Jackson Iron & Steel Company	1	95,000
Lowellville		
Sharon Steel Corporation	1	148,600
Martins Ferry		
Louis Berkman Company	1	136,800
Massillon		
Republic Steel Corporation	1	266,000
Middletown		
Armco Steel Corporation	1	572,000
New Miami		
Armco Steel Corporation	2	630,000
Portsmouth		
Detroit Steel Corporation	2	768,700
Steubenville		
Wheeling Steel Corporation	5	1,614,000
Struthers		
Pittsburgh Coke & Chemical Company	1	182,500
Warren		
Republic Steel Corporation	1	569,000
Youngstown		
Republic Steel Corporation	5	1,773,000
United States Steel Corp. (Central Operations)	6	2,101,400
Youngstown Sheet and Tube Company	2	504,000
SubTotal (Pitts. - Youngs. Dist.)	36	11,358,000
Ohio (Cleveland - Detroit District)		
Cleveland		
American Steel & Wire Division	2	752,000
Jones & Laughlin Steel Corporation	2	760,000
Republic Steel Corporation	6	2,534,000
Lorain		
National Tube Division	5	1,995,000
Toledo		
Interlake Iron Corporation	2	551,000
SubTotal (Clev. - Det. Dist.)	17	6,592,000
TOTAL—Ohio	53	17,950,000
Pennsylvania (Pittsburgh - Youngstown District)		
Aliquippa		
Jones & Laughlin Steel Corporation	5	1,920,000
Braddock		
United States Steel Corp. (Central Operations)	7	2,730,200
Clairton		
United States Steel Corp. (Central Operations)	3	772,600
Donora		
American Steel & Wire Division	2	450,000
Duquesne		
United States Steel Corp. (Central Operations)	6	(a) 1,338,000
Farrell		
Sharon Steel Corporation	2	665,800
McKeesport		
National Tube Division	4	1,280,000
Midland		
Crucible Steel Company of America	3	895,000
Monessen		
Pittsburgh Steel Company	3	980,000
Neville Island		
Pittsburgh Coke & Chemical Company	2	654,000
Pittsburgh		
Jones & Laughlin Steel Corporation	6	1,927,000
Rankin		
United States Steel Corp. (Central Operations)	6	2,236,800
Sharpsville		
Shenango Furnace Company	2	445,450
SubTotal (Pitts. - Youngs. Dist.)	51	16,294,850
Pennsylvania (Eastern District)		
Bethlehem		
Bethlehem Steel Company	7	2,708,000
Birdsboro		
Colorado Fuel and Iron Corporation	1	151,200
Chester		
Barium Steel Corp.:		
Phoenix Iron and Steel Co.	1	200,000
Erie		
Interlake Iron Corporation	1	271,000
Fairless Hills		
United States Steel Corp. (Central Operations)	2	1,252,000
Johnstown		
Bethlehem Steel Company	7	(b) 1,746,000
Palmerton		
New Jersey Zinc Company	2	(c) 112,000
Sheridan		
Lavino and Company, E. J.	1	(d) 56,000
Steelton		
Bethlehem Steel Company	3	1,008,000
Swedeland		
Alan Wood Steel Company	2	454,800
SubTotal (Eastern Dist.)	27	7,959,000
TOTAL—Pennsylvania	78	(e) 24,253,850
Tennessee (Southern District)		
Lyles-Wrigley		
Merritt-Chapman & Scott Corp.:		
Tennessee Products & Chemical Corp.	1	36,300
Rockwood		
Merritt-Chapman & Scott Corp.:		
Tennessee Products & Chemical Corp.	2	181,440
TOTAL	3	217,740
Texas (Southern District)		
Houston		
Sheffield Division	1	420,000
Lone Star		
Lone Star Steel Company	1	385,000
TOTAL	2	805,000
Utah (Western District)		
Geneva		
Columbia-Geneva Steel Division	3	1,321,500
Ironton		
Columbia-Geneva Steel Division	2	482,700
TOTAL	5	1,804,200
Virginia (Southern District)		
Lynchburg		
Lavino and Company, E. J.	2	(a) 128,000
West Virginia (Pittsburgh - Youngstown District)		
Benwood		
Wheeling Steel Corporation	1	246,000
Weirton		
Weirton Steel Company	4	2,100,000
TOTAL	5	2,346,000
DISTRIBUTION BY DISTRICTS:		
Eastern	54	(b) 17,808,000
Pittsburgh-Youngstown	95	(c) 30,900,850
Cleveland-Detroit	25	10,361,480
Chicago	48	17,194,500
Southern	28	(d) 6,551,080
Western	12	4,002,040
TOTAL	262	(e) 86,817,950

(a) Ferromanganese only.
(b) Includes 384,000 tons ferroalloys capacity.
(c) Includes 237,600 tons ferroalloys capacity.
(d) Includes 167,000 tons ferroalloys capacity.
(e) Includes 788,600 tons ferroalloys capacity.

Coke

THE cokemaking capacity of the nation's iron and steel industry slipped slightly (268,560 net tons) in the last three years. Capacity now is 72,970,980 net tons. We have 122 more coal chemical recovery ovens than we had three years ago, but there are 1894 fewer beehives.

Coke Capacity by Plant Location and Operating Company

	BEEHIVE		OTHER		Total annual capacity (N. T.)
Plant Location and Operating Company:	No. of ovens	Annual capacity (N. T.)	No. of ovens	Annual capacity (N. T.)	
Alabama (Southern District)					
Birmingham					
Republic Steel Corporation	.....	.....	65	375,000	375,000
Fairfield					
Tennessee Coal & Iron Division	.....	.....	558	3,032,500	3,032,500
Gadsden					
Republic Steel Corporation	.....	.....	102	565,000	565,000
North Birmingham					
United States Pipe & Foundry Co.	.....	.....	180	900,000	900,000
Woodward					
Woodward Iron Company	.....	.....	256	938,000	938,000
TOTAL	.....	.....	1,161	5,810,500	5,810,500
California (Western District)					
Fontana					
Kaiser Steel Corporation	.....	.....	225	1,006,000	1,006,000
Colorado (Western District)					
Pueblo					
Colorado Fuel and Iron Corporation	.....	.....	266	1,220,000	1,220,000
Illinois (Chicago District)					
Chicago					
Interlake Iron Corporation	.....	.....	130	542,000	542,000
International Harvester Company	.....	.....	155	750,000	750,000
Republic Steel Corporation	.....	.....	75	460,000	460,000
Youngstown Sheet and Tube Co.	.....	.....	70	420,000	420,000
Granite City					
Granite City Steel Company	.....	.....	76	450,000	450,000
Joliet					
United States Steel Corp. (Central Operations)	.....	.....	140	464,900	464,900
TOTAL	.....	.....	646	3,086,900	3,086,900
Indiana (Chicago District)					
East Chicago					
Inland Steel Company	.....	.....	505	2,598,190	2,598,190
Youngstown Sheet and Tube Co.	.....	.....	270	1,572,000	1,572,000
Gary					
United States Steel Corp. (Central Operations)	.....	.....	1,162	5,400,000	5,400,000
TOTAL	.....	.....	1,937	9,570,190	9,570,190
Maryland (Eastern District)					
Sparrows Point					
Bethlehem Steel Company	.....	.....	687	3,764,000	3,764,000
Massachusetts (Eastern District)					
Everett					
Eastern Gas and Fuel Associates	..	.....	108	664,000	664,000
Michigan (Cleveland - Detroit District)					
Dearborn					
Ford Motor Company	.....	.....	220	1,320,790	1,320,790
River Rouge					
Great Lakes Steel Corporation	.....	.....	294	2,000,000	2,000,000
TOTAL	.....	.....	514	3,320,790	3,320,790
Minnesota (Chicago District)					
Duluth					
American Steel & Wire Division	.....	.....	115	583,600	583,600
Interlake Iron Corporation	.....	.....	61	310,000	310,000
TOTAL	.....	.....	176	893,600	893,600
New York (Eastern District)					
Buffalo					
*Donner-Hanna Coke Corporation	.....	.....	252	1,170,000	1,170,000
Lackawanna					
Bethlehem Steel Company	.....	.....	459	2,514,000	2,514,000
TOTAL	.....	.....	711	3,684,000	3,684,000
Ohio (Pittsburgh - Youngstown District)					
Campbell					
Youngstown Sheet and Tube Co.	.....	.....	356	1,776,000	1,776,000
Canton					
Republic Steel Corporation	.....	.....	62	240,000	240,000
Massillon					
Republic Steel Corporation	.....	.....	31	188,000	188,000
Middletown					
Armco Steel Corporation	.....	.....	76	475,000	475,000
New Miami					
Armco Steel Corporation	.....	.....	110	570,000	570,000
Portsmouth					
Detroit Steel Corporation	.....	.....	108	550,000	550,000
Warren					
Republic Steel Corporation	.....	.....	141	870,000	870,000
Youngstown					
Republic Steel Corporation	.....	.....	172	1,000,000	1,000,000
Youngstown Sheet and Tube Co.	.....	.....	84	372,000	372,000
SubTotal (Pitts. - Youngs. Dist.)	.....	.....	1,140	6,041,000	6,041,000
Ohio (Cont.) (Cleveland - Detroit District)					
Cleveland					
American Steel & Wire Division	.....	.....	180	834,500	834,500
Jones & Laughlin Steel Corporation	.....	.....	100	354,000	354,000
Republic Steel Corporation	.....	.....	354	1,781,000	1,781,000
Lorain					
National Tube Division	.....	.....	354	1,602,200	1,602,200
Toledo					
Interlake Iron Corporation	.....	.....	151	518,000	518,000
SubTotal (Clev. - Det. Dist.)	.....	.....	1,139	5,089,700	5,089,700
TOTAL—Ohio	.....	.....	2,279	11,130,700	11,130,700
Pennsylvania (Pittsburgh - Youngstown District)					
Aliquippa					
Jones & Laughlin Steel Corporation	.....	.....	352	2,190,000	2,190,000
Brownsville Junction					
Republic Steel Corporation	296	215,000	.....	.....	215,000
Clairton					
United States Steel Corp. (Central Operations)	.....	.....	1,567	7,833,800	7,833,800
Midland					
Crucible Steel Company of America	.....	.....	213	831,600	831,600
Monessen					
Pittsburgh Steel Company	320	228,000	93	644,000	872,000
Mount Pleasant					
Carpentertown Coal & Coke Co.	277	160,000	.....	.....	160,000
Neville Island					
Pittsburgh Coke & Chemical Co.	.....	.....	140	1,000,000	1,000,000
Pittsburgh					
Jones & Laughlin Steel Corporation	.....	.....	379	1,344,000	1,344,000
Various					
United States Steel Corp. (Central Operations)	1,716	1,042,600	.....	.....	1,042,600
SubTotal (Pitts. - Youngs. Dist.)	2,609	1,645,600	2,744	13,843,400	15,489,000
Pennsylvania (Eastern District)					
Bethlehem					
Bethlehem Steel Company	.....	.....	496	2,136,000	2,136,000
Erie					
Interlake Iron Corporation	.....	.....	58	267,000	267,000
Fairless Hills					
United States Steel Corp. (Central Operations)	.....	.....	174	952,100	952,100
Johnstown					
Bethlehem Steel Company	.....	.....	436	2,268,000	2,268,000
Steelton					
Bethlehem Steel Company	.....	.....	130	768,000	768,000
Swedeland					
Alan Wood Steel Company	.....	.....	151	600,000	600,000
SubTotal (Eastern Dist.)	.....	.....	1,445	6,991,100	6,991,100
TOTAL—Pennsylvania	2,609	1,645,600	4,189	20,834,500	22,480,100
Tennessee (Southern District)					
Chattanooga					
Merritt-Chapman & Scott Corp.: Tennessee Products & Chemical Corp.	.....	.....	44	251,500	251,500
Texas (Southern District)					
Houston					
Sheffield Division	.....	.....	62	360,000	360,000
Lone Star					
Lone Star Steel Company	.....	.....	78	438,000	438,000
TOTAL	.....	.....	140	798,000	798,000
Utah (Western District)					
Geneva					
Columbia-Geneva Steel Division	.....	.....	252	1,094,500	1,094,500
Ironton					
Columbia-Geneva Steel Division	.....	.....	56	251,200	251,200
Sunnyside					
Kaiser Steel Corporation	297	100,000	.....	.....	100,000
TOTAL	297	100,000	308	1,345,700	1,445,700
West Virginia (Pittsburgh - Youngstown District)					
East Steubenville					
Wheeling Steel Corporation	.....	.....	314	1,720,000	1,720,000
Fairmont					
Sharon Steel Corporation	.....	.....	60	225,000	225,000
Weirton					
Weirton Steel Company	.....	.....	294	1,900,000	1,900,000
TOTAL	.....	.....	668	3,845,000	3,845,000
DISTRIBUTION BY DISTRICTS:					
Eastern	.....	.....	2,951	15,103,100	15,103,100
Pittsburgh-Youngstown	2,609	1,645,600	4,553	23,729,400	25,375,000
Cleveland-Detroit	.....	.....	1,653	8,410,490	8,410,490
Chicago	.....	.....	2,759	13,550,690	13,550,690
Southern	.....	.....	1,345	6,860,000	6,860,000
Western	297	100,000	799	3,571,700	3,671,700
TOTAL	2,906	1,745,600	14,059	71,225,380	72,970,980

* Owned jointly by the Hanna Furnace Corporation and Republic Steel Corporation.

Coke Capacity by Companies

	BEEHIVE		OTHER		Total annual capacity (N. T.)
	No. of ovens	Annual capacity (N. T.)	No. of ovens	Annual capacity (N. T.)	
Companies:					
Alan Wood Steel Company	.....	.....	151	600,000	600,000
Armco Steel Corporation	.....	.....	186	1,045,000	1,045,000
Sheffield Division	.....	.....	62	360,000	360,000
TOTAL	.....	.....	248	1,405,000	1,405,000
Bethlehem Steel Company	.....	.....	2,208	11,150,000	11,150,000
Colorado Fuel and Iron Corporation	.....	.....	266	1,220,000	1,220,000
Crucible Steel Company of America	.....	.....	213	831,600	831,600
Detroit Steel Corporation	.....	.....	108	550,000	550,000
Eastern Gas and Fuel Associates	.....	.....	108	661,000	661,000
Ford Motor Company	.....	.....	220	1,320,790	1,320,790
Granite City Steel Company	.....	.....	76	450,000	450,000
Inland Steel Company	.....	.....	505	2,598,190	2,598,190
Interlake Iron Corporation	.....	.....	400	1,637,000	1,637,000
International Harvester Company	.....	.....	155	750,000	750,000
Jones & Laughlin Steel Corporation	.....	.....	831	3,888,000	3,888,000
Kaiser Steel Corporation	297	100,000	225	1,006,000	1,106,000
Lone Star Steel Company	.....	.....	78	438,000	438,000
Merritt-Chapman & Scott Corp.:					
Tennessee Products & Chemical Corp.	.....	.....	44	251,500	251,500
National Steel Corporation:					
Great Lakes Steel Corporation	.....	.....	294	2,000,000	2,000,000
Hanna Furnace Corporation	.....	.....	126	*585,000	*585,000
Weirton Steel Company	.....	.....	294	1,900,000	1,900,000
TOTAL	.....	.....	714	4,485,000	4,485,000
Pittsburgh Coke & Chemical Company	.....	.....	140	1,000,000	1,000,000
Pittsburgh Steel Company	320	228,000	93	644,000	872,000
Republic Steel Corporation	296	215,000	1,128	*6,064,000	*6,279,000
Sharon Steel Corporation	.....	.....	60	225,000	225,000
Carpentertown Coal & Coke Co.	277	160,000	...	.....	160,000
TOTAL	277	160,000	60	225,000	385,000
United States Pipe & Foundry Co.	.....	.....	180	900,000	900,000
United States Steel Corporation:					
United States Steel Corp. (Central Operations)	1,716	1,042,600	3,043	14,650,800	15,693,400
American Steel & Wire Division	...	...	295	1,418,100	1,418,100
Columbia-Geneva Steel Division	...	...	308	1,345,700	1,345,700
National Tube Division	...	...	351	1,602,200	1,602,200
Tennessee Coal & Iron Division	...	...	558	3,032,500	3,032,500
TOTAL	1,716	1,042,600	4,558	22,049,300	23,091,900
Wheeling Steel Corporation	...	...	314	1,720,000	1,720,000
Woodward Iron Company	...	...	256	938,000	938,000
Youngstown Sheet and Tube Company	...	...	780	4,140,000	4,140,000
GRAND TOTAL	2,906	1,745,600	14,059	71,225,290	72,970,980

* Includes 50% of coke capacity of the Donner-Hanna Coke Corporation, Buffalo, New York

Company Names and Addresses (Continued from page 124)

Eastern Gas & Fuel Associates
250 Stuart St., Boston 16, Mass.

Eastern Stainless Steel Corp.
P.O. Box 1975
Baltimore 3, Md.

Eaton Mfg. Co., Massillon, O.

Edgewater Steel Co.
P.O. Box 478
Pittsburgh 30, Pa.

Edwards Co., E. H.
Butler Rd. & Industrial Way
South San Francisco, Calif.

Elco Steel Products Co.
New Castle, Pa.

Electro Metallurgical Co.
Division of Union Carbide Corp.
30 E. 42nd St.
New York 17, N.Y.

Electro Metallurgical Co.
Division of Union Carbide Canada Ltd.
330 University Ave.
Toronto 1, Ont., Canada

Electroweld Steel Corp.
505 W. Foothill Blvd.
Azusa, Calif.

Empire Steel Corp.
Mansfield, O.

Enamel & Heating Products Ltd.
Amherst, N.S., Canada

Enterprise Wire Co.
13157 Gregory St.
Blue Island, Ill.

Erie Forge & Steel Corp.
1341 W. 16th St., Erie, Pa.

Exolon Co., Tonawanda, N.Y.

Falls Hollow Staybolt Co.
7 Portage Trail
Cuyahoga Falls, O.

Finkl & Sons Co., A.
2011 Southport Ave.
Chicago 14, Ill.

Firth Sterling Inc., 3113 Forbes St.
Pittsburgh 13, Pa.

Fitzsimons Steel Co. Inc.
1623 Wilson Ave.
Youngstown 1, O.

Follansbee Steel Corp.
Follansbee, W. Va.

Ford Motor Co., Dearborn, Mich.

Formed Tubes Inc., Sturgis, Mich.

Fort Howard Steel & Wire Division,
Research Parts & Eng. Corp.
Green Bay, Wis.

Fretz-Moon Tube Co. Inc.
Box 551, Butler, Pa.

Gaychrome Co.
1079 Southbridge St.
Worcester, Mass.

Gilbert & Bennett Mfg. Co. Inc.
Georgetown, Conn.

Graham Nail & Wire Products Ltd.
35 Fraser Ave.
Toronto 1, Ont., Canada

Granite City Steel Co.
Granite City, Ill.

Great Lakes Steel Corp.
Ecorse, Detroit 29, Mich.

Green River Steel Corp.
Owensboro, Ky.

Greer Steel Co., Dover, O.

Griffin Mfg. Co., 1515 Cherry St.
Erie, Pa.

Hanna Furnace Corp.
Ecorse, Detroit 29, Mich.

Harris Tube Inc.
8720 S. San Pedro St.
Los Angeles 3, Calif.

Harrisburg Steel Co.
Division of Harsco Corp.
Harrisburg, Pa.

Harsco Corp., Harrisburg, Pa.

Heppenstall Co., 4620 Hatfield St.
Pittsburgh 1, Pa.

Highland Iron & Steel Inc.
Terre Haute, Ind.

Hind Steel Co. Inc.
2146 Stanley Terrace
Union, N.J.

Hofmann Industries Inc.
Sinking Springs, Pa.

Hoster Steel Corp., P.O. Box 2638
Oklahoma City 8, Okla.

Igoe Bros. Inc.
Avenue A & Poinier St.
Newark 5, N.J.

Indiana Steel & Wire Co.
Muncie, Ind.

Industrial Forge & Steel Inc.
1502 Allen Ave. S.E.
Canton 1, O.

Inland Steel Co.
38 S. Dearborn St.
Chicago 3, Ill.

Interlake Iron Corp.
1900 Union Commerce Bldg.
Cleveland 14, O.

International Harvester Co.
180 N. Michigan Ave.
Chicago 1, Ill.

Isaacson Iron Works Inc.
P.O. Box 3625
Seattle 24, Wash.

Ivins Steel Tube Works Inc., Ellwood
Oak Lane Station
Philadelphia 26, Pa.

Jackson Iron & Steel Co.
Jackson, O.

Jersey Shore Steel Co.
Jersey Shore, Pa.

Jessop Steel Co.
Washington, Pa.

Johnson Steel & Wire Co. Inc.
53 Wiser Ave.
Worcester 1, Mass.

Jones & Laughlin Steel Corp.
3 Gateway Center
Pittsburgh 30, Pa.

Joslyn Mfg. & Supply Co.
20 N. Wacker Dr.
Chicago 6, Ill.

Judson Steel Corp.
4200 Eastshore Highway
Emeryville, Calif.

Kaiser Steel Corp., 1924 Broadway
Oakland 12, Calif.

Kane Boiler Works Inc.
P.O. Box 546
Galveston, Tex.

Keokuk Electro-Metals Co.
Keokuk, Iowa

Keystone Drawn Steel Co.
Spring City, Pa.

Keystone Steel & Wire Co.
Peoria 7, Ill.

Kidd Drawn Steel Co.
Aliquippa, Pa.

Kilby Steel Co., Anniston, Ala.

Knoxville Iron Co.
Knoxville 2, Tenn.

Laclede Steel Co., Arcade Bldg.
St. Louis 1, Mo.

LaSalle Steel Co.
130 E. Randolph Dr.
Chicago 1, Ill.

Latrobe Steel Co.
2626 Ligonier St.
Latrobe, Pa.

Lavino & Co., E. J.
3 Penn Center Plaza
Philadelphia 2, Pa.

Le Tourneau Inc., R. G.
Longview, Tex.

Lockhart Iron & Steel Co.
P.O. Box 1165, Pittsburgh 30, Pa.

Lone Star Steel Co.
W. Mockingbird Lane at Roper
Box 12226, Dallas 5, Tex.

Lukens Steel Co., Coatesville, Pa.

Mac Whyte Co., 2906 14th Ave.
Kenosha, Wis.

Madison Wire Co. Inc.
324 Indian Church Rd.
Buffalo, N.Y.

Mahoning Valley Steel Co.
Niles, O.

Manitoba Rolling Mill Co. Ltd.
845 Logan Ave. W.
Winnipeg, Man., Canada

Mannesmann Tube Co. Ltd.
Wallace Terrace
Sault Ste. Marie, Ont., Canada

Mark & Co., Clayton
1900 Dempster St.
Evanston, Ill.

Maryland Fine & Specialty Wire Co. Inc., Cockeysville, Md.

Master Tank & Welding Ltd.
1612 Singleton Blvd., Dallas, Tex.

McInnes Steel Co.
441 E. Main St., Corry, Pa.

McLouth Steel Corp.
300 S. Livernois Ave.
Detroit 17, Mich.

Merritt-Chapman & Scott Corp.
260 Madison Ave.
New York 16, N.Y.

Mesta Machine Co.
P.O. Box 1466
Pittsburgh 30, Pa.

Metal & Thermit Corp.
100 Park Ave.
New York 17, N.Y.

Michigan Seamless Tube Co.
400 West St., South Lyon, Mich.

Mid-States Steel & Wire Co.
Crawfordsville, Ind.

Midvale-Heppenstall Co.
Nicetown, Philadelphia 40, Pa.

Mill Strip Products Co.
2420 Oakton St., Evanston, Ill.

Mississippi Steel Corp.
Pearl Branch
Jackson 8, Miss.

Missouri Rolling Mill Corp.
6800 Manchester Ave.
St. Louis 10, Mo.

Moltrup Steel Products Co.
Beaver Falls, Pa.

Molybdenum Corp. of America
Washington, Pa.

Monroe Auto Equipment Co.
1426 E. First St.
Monroe, Mich.

Monsanto Chemical Co.
1700 S. Second St.
St. Louis 4, Mo.

Morrison Steel & Wire Co. Ltd.
Granville Island
Voncouver, B.C., Canada

National Forge & Ordnance Co.
Irvine, Pa.

National-Standard Co., Niles, Mich.

National Steel Corp.
2800 Grant Bldg.
Pittsburgh 19, Pa.

National Supply Co., P.O. Box 416
Pittsburgh 30, Pa.

National Tube Division
U.S. Steel Corp.
525 Wm. Penn Place
Pittsburgh 30, Pa.

Naylor Pipe Co., 1230 E. 92nd St.
Chicago 19, Ill.

Nelsen Steel & Wire Co.
9400 Belmont Ave.
Franklin Park, Ill.

New England High Carbon Wire Co.
50 Howe Ave., Millbury, Mass.

New Jersey Zinc Co. (of Pa.)
160 Front St.
New York 38, N.Y.

Newman-Crosby Steel Co.
10 Dean St., Pawtucket, R.I.

Nichols Wire & Aluminum Co.
1725 Rockingham Rd.
Davenport, Iowa

Nikoh Tube Co.
5000 S. Whipple St.
Chicago 32, Ill.

Northeastern Steel Corp.
837 Seaview Ave.
Bridgeport, Conn.

Northern Steel Inc., 1 State St.
Boston 9, Mass.

Northwest Steel Rolling Mills Inc.
4315 Ninth Ave. N.W.
Seattle 7, Wash.

Northwestern Steel & Wire Co.
Sterling, Ill.

Ohio Ferro-Alloys Corp.
839-30th St. N.W.
Canton, O.

Oregon Steel Mills
5250 N.W. Front Ave.
Portland 10, Oreg.

Pacific States Steel Corp.
Niles, Calif.

Pacific Steel Rolling Mills Inc.
1750 Fourth Ave. S.
Seattle 4, Wash.

Pacific Tube Co.
5710 Smithway St.
Los Angeles 22, Calif.

Page-Hersey Tubes Ltd.
100 Church St.
Toronto 1, Ont., Canada

Pender & Co. Ltd., James
300-321 Charlotte St.
St. John, N.B., Canada

Phoenix Iron & Steel Co.
Phoenixville, Pa.

Phoenix Mfg. Co., Industry Ave.
Joliet, Ill.

Pilgrim Drawn Steel Division
Automated Materials Corp.
2300 Fisher Bldg.
Detroit 2, Mich.

Pittsburgh Coke & Chemical Co.
2000 Grant Bldg.
Pittsburgh 19, Pa.

Pittsburgh Metallurgical Co. Inc.
3801 Highland Ave.
Niagara Falls, N.Y.

Pittsburgh Steel Co.
1600 Grant Bldg.
P.O. Box 118
Pittsburgh 30, Pa.

Pittsburgh Tool Steel Wire Co.
Monaca, Pa.

Pittsburgh Tube Co., 212 Wood St.
Pittsburgh 22, Pa.

Plymouth Steel Corp.
6143 Epworth Blvd.
Detroit 10, Mich.

Pollak Steel Co., P.O. Box 237
Cincinnati, O.

Poor & Co. Inc., 50 Church St.
New York 7, N.Y.

Porter Company Inc., H. K.
340 Alcoa Bldg.
Pittsburgh 22, Pa.

(Please turn to page 129)

Precision Drawn Steel Co.
3600 River Rd., Camden, N.J.
Precision Steel Corp.
145 Howard Ave.
Bridgeport 5, Conn.
Premier Steel Mills Ltd.
P.O. Box 348
Edmonton, Alta., Canada
Reed & Prince Mfg. Co.
1 Duncan Ave.
Worcester 1, Mass.
Reid-Avery Co. Inc.
Dundalk, Baltimore 22, Md.
Republic Steel Corp.
Republic Bldg.
Cleveland 1, O.
Rhode Island Steel Corp.
Pawtucket, R.I.
Rodney Metals Inc.
261 Fifth Ave.
New York 16, N.Y.
Roebling's Sons Corp., John A.
640 South Broad St.
Trenton 2, N.J.
Rome Mfg. Co., 201-203 Mill St.
Rome, N.Y.
Rome Strip Steel Co. Inc.
530 Henry St., Rome, N.Y.
Rotary Electric Steel Co.
(Now the Stainless Division of Jones & Laughlin Steel Corp.)
Box 4606, Detroit 34, Mich.

Sawhill Tubular Products Inc.
Sharon, Pa.
Seneca Wire & Mfg. Co.
P.O. Box 71, S. Vine St.
Fostoria, O.
Service Steel Division
Van Pelt Corp.
1435 Franklin St.
Detroit 7, Mich.
Sharon Steel Corp., Sharon, Pa.
Sharon Tube Co., Sharon, Pa.
Sheffield Division
Armco Steel Corp.
Sheffield Sta.
Kansas City 3, Mo.
Shenango Furnace Co.
812 Oliver Bldg.
Pittsburgh 22, Pa.
Sherman Steel & Wire Co.
1300 Pacific St.
Sherman, Tex.
Shwayder Bros. Inc., 4270 High St.
Detroit 29, Mich.
Sierra Drawn Steel Corp.
5821 E. Randolph St.
Los Angeles, Calif.
Simmons Co., 300 Park Ave.
New York 22, N.Y.
Simonds Canada Abrasive Co. Ltd.
Arvida, Que., Canada
Simonds Saw & Steel Co.
470 Main St., Fitchburg, Mass.
Smith Corp., A. O.
3533 N. 27th St.
Milwaukee 1, Wis.
Smith Corp. of Texas, A. O.
Houston, Tex.
Smith Co., Ivy H., 3050 Melson Ave.
Jacksonville 5, Fla.
Sorel Industries Ltd.
Sorel, Que., Canada
Southeastern Metals Co. Inc.
3925 N. 29th St.
North Birmingham, Ala.
Southern Electric Steel Co.
2301 Huntsville Rd.
Birmingham, Ala.
Southern Pipe & Casing Co.
P.O. Box C, Azusa, Calif.
Standard Forgings Corp.
80 E. Jackson Blvd.
Chicago 4, Ill.
Standard Tube Co.
24400 Plymouth Rd.
Detroit 39, Mich.
Standard Tube & T. I. Ltd.
Woodstock, Ont., Canada
Stanley Steel Co. Ltd.
Hamilton, Ont., Canada
Stanley Works, New Britain, Conn.
State Canvas & Frame Supply Co.
4019 Medford St.
Los Angeles 63, Calif.
Steel Co. of Canada Ltd.
Hamilton, Ont., Canada
Superior Drawn Steel Co.
Monaca, Pa.
Superior Steel Corp.
Carnegie, Pa.
Superior Tube Co.
Norristown, Pa.
Sweet's Steel Co.
Williamsport, Pa.

Taylor Forge & Pipe Works
4735 W. 14th St., Chicago, Ill.
Tennessee Coal & Iron Division
U.S. Steel Corp.
Box 599, Fairfield, Ala.
Tenn-Tex Alloy & Chemical Corp.
Houston, Tex.
Tennessee Products & Chemical Corp.
First American National Bank Bldg.
Nashville 3, Tenn.
Texas Steel Co., 3901 Hemphill St.
Ft. Worth, Tex.
Thompson Wire Co., 41 Mildred Ave.
Boston 26, Mass.
Timken Roller Bearing Co.
1835 Dueber Ave. S.W.
Canton 6, O.

Titanium Alloy Mfg. Division
National Lead Co.
111 Broadway, New York 6, N.Y.
Toledo Steel Tube Co.
2105 Smead Ave., Toledo 6, O.
Tonawanda Iron Division
American Radiator & Standard Sanitary Corp.
North Tonawanda, N.Y.
Townsend Co.
New Brighton, Pa.
Tredegar Co., Richmond, Va.
Trent Tube Co., 498 S. Church St.
East Troy, Wis.
Trenton Steel Works Ltd.
Main St., Trenton, N.S., Canada
Tube Reducing Corp.
520 Main Ave.
Wallington, N.J.

Union Drawn Steel Co. Ltd.
Hamilton, Ont., Canada
Union Electric Steel Corp.
2334 Oliver Bldg.
Pittsburgh 22, Pa.
Union Steel Corp.
2150 Stanley Terrace
Union, N.J.
Union Wire Rope Corp.
21st & Manchester Ave.
Kansas City 26, Mo.
United States Pipe & Foundry Co.
3300 First Ave. N.
Birmingham, Ala.
United States Steel Corp.
71 Broadway, New York 6, N.Y.
United Tube Corp. of Ohio
3860 E. 91st St.
Cleveland 5, O.
Universal-Cyclops Steel Corp.
Bridgeville, Pa.

Valley Mould & Iron Corp.
Hubbard, O.
Van Huffel Tube Corp., Warren, O.
Vanadium-Alloys Steel Canada Ltd.
London, Ont., Canada
Vanadium-Alloys Steel Co.
Latrobe, Pa.
Vanadium Corp. of America
420 Lexington Ave.
New York 17, N.Y.
Vulcan Crucible Steel Division
H. K. Porter Company Inc.
West Aliquippa, Pa.
Wallace Barnes Co., Bristol, Conn.
Wallingford Steel Co.
Wallingford, Conn.

Washburn Wire Co.
Phillipsdale 16, R.I.
Washington Steel Corp.
Washington, Pa.
Weirton Steel Co. Division
National Steel Corp.
Weirton, W. Va.
Welland Tubes Ltd.
100 Church St.
Toronto 1, Ont., Canada
Western Automatic Machine Screw Co., Elyria, O.
Western Canada Steel Ltd.
Granville Island
Vancouver 1, B.C., Canada
Western Rolling Mills Inc.
341 N. Montgomery St.
San Jose, Calif.
Wheatland Tube Co.
1300 Bankers Securities Bldg.
Philadelphia 7, Pa.
Wheeling Steel Corp.
Wheeling, W. Va.
Wickwire Bros. Inc.
189 Main St., Cortland, N.Y.
Williams Mfg. Co., Ft. Smith, Ark.
Wilson Steel & Wire Co.
4840 S. Western Ave.
Chicago 9, Ill.
Wire Sales Co., 4630 W. 54th St.
Chicago 32, Ill.
Woodward Iron Co.
Woodward, Ala.
Wright Steel & Wire Co., G. F.
243 Stafford St.
Worcester 3, Mass.
Wyckoff Steel Co.
603 Stanwix St.
Pittsburgh 22, Pa.

Youngstown Sheet & Tube Co.
Stambaugh Bldg.
Youngstown 1, O.

Canadian Capacities

CANADA'S steelmaking, blast furnace and cokemaking capacities are larger than they were three years ago. The increases: Steelmaking, 1,192,850 net tons; blast furnace, 630,720 net tons; and cokemaking, 96,000 net tons.

Canada achieved her increase in steelmaking capacity while reducing her total number of furnaces. She now has 37 open-hearth furnaces, compared with 43 three years ago. Furnaces have been enlarged and otherwise made increasingly productive. Canada has 26 electric steelmaking furnaces, one more than she had three years ago.

One blast furnace and 24 coke ovens have been added in the last three years.

Canada's hot-rolling capacity has increased, too. It's now 4,896,810 net tons, a rise of 987,800 tons.

Steel Ingot Capacity (Canada)

	OPEN HEARTH		BESSEMER		ELECTRIC		Total Annual capacity (N. T.)
	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	No.	Annual capacity (N. T.)	
Kinds:							
Open hearth—Basic	35	4,754,000	..	....	..	....	4,754,000
Oxygen Converter	2	400,000	..	....	..	....	400,000
Bessemer	..	....	(a) 2	120,000	..	....	120,000
Electric	..	....	..	....	26	710,700	710,700
TOTAL	(b) 37	5,154,000	(a) 2	120,000	26	710,700	5,984,700
Companies:							
Algoma Steel Corporation, Ltd.	13	1,140,000	(a) 2	120,000	..	....	1,260,000
Atlas Steels, Ltd.	..	....	..	....	9	170,400	170,400
Burlington Steel Company, Ltd.	..	....	..	....	1	26,400	26,400
Dominion Foundries and Steel Ltd.	(b) 3	710,000	..	....	5	190,000	900,000
Dominion Steel & Coal Corp., Ltd.:							
Canadian Tube & Steel Products, Ltd.	..	....	..	....	3	98,900	98,900
Dominion Iron & Steel Ltd.	6	900,000	..	....	1	33,000	933,000
TOTAL	6	900,000	..	....	4	131,900	1,031,900
Manitoba Rolling Mill Co., Ltd.	2	54,000	..	....	2	65,000	119,000
Premier Steel Mills Ltd.	..	....	..	....	1	42,000	42,000
Sorel Industries, Ltd.	..	....	..	....	3	40,000	40,000
Steel Company of Canada, Ltd.	13	2,350,000	..	....	..	....	2,350,000
Western Canada Steel Ltd.:							
Vancouver Steel Co. Ltd.	..	....	..	....	1	45,000	45,000
TOTAL	(b) 37	5,154,000	(a) 2	120,000	26	710,700	5,984,700
Plant Location and Operating Company:							
Edmonton — **Alberta**							
Premier Steel Mills Ltd.	..	....	..	....	1	42,000	42,000
Vancouver — **British Columbia**							
Western Canada Steel Ltd.:							
Vancouver Steel Co. Ltd.	..	....	..	....	1	45,000	45,000
Selkirk — **Manitoba**							
Manitoba Rolling Mill Co., Ltd.	2	54,000	..	....	2	65,000	119,000
Sydney — **Nova Scotia**							
Dominion Steel & Coal Corp., Ltd.:							
Dominion Iron & Steel Ltd.	6	900,000	..	....	1	33,000	933,000
Hamilton — **Ontario**							
Burlington Steel Company, Ltd.	..	....	..	....	1	26,400	26,400
Dominion Foundries and Steel Ltd.	(b) 3	710,000	..	....	5	190,000	900,000
Steel Company of Canada, Ltd.	13	2,350,000	..	....	..	....	2,350,000
Sault Ste. Marie							
Algoma Steel Corporation, Ltd.	13	1,140,000	(a) 2	120,000	..	....	1,260,000
Welland							
Atlas Steels, Ltd.	..	....	..	....	9	170,400	170,400
TOTAL — ONTARIO	(b) 29	4,200,000	(a) 2	120,000	15	386,800	4,706,800
Montreal — **Quebec**							
Dominion Steel & Coal Corp., Ltd.:							
Canadian Tube & Steel Products, Ltd.	..	....	..	....	3	98,900	98,900
Sorel							
Sorel Industries, Ltd.	..	....	..	....	3	40,000	40,000
TOTAL — QUEBEC	..	....	..	....	6	138,900	138,900

(a) Used in melting charge for open hearth furnaces and for Bessemer steel.
(b) Oxygen Converters.

Blast Furnace Capacity (Canada)

	Plant Location	No. of stacks	Annual pig iron capacity (N. T.)
Algoma Steel Corporation, Limited	Sault Ste. Marie, Ont.	5	1,280,000
Canadian Furnace Co., Limited	Port Colborne, Ont.	2	258,620
Dominion Foundries and Steel, Limited	Hamilton, Ont.	2	730,000
Dominion Steel & Coal Corporation, Ltd.:			
Dominion Iron & Steel, Limited	Sydney, N. S.	3	684,400
Steel Company of Canada, Limited	Hamilton, Ont.	4	1,241,000
TOTAL		16	4,194,020

Coke Capacity (Canada)

	Plant Location	No. of ovens	Annual capacity (N. T.)
Algoma Steel Corporation, Limited	Sault Ste. Marie, Ont.	250	1,340,000
Dominion Foundries and Steel, Limited	Hamilton, Ont.	60	381,000
Dominion Steel & Coal Corporation, Ltd.:			
Dominion Iron & Steel, Limited	Sydney, N. S.	114	612,000
Steel Company of Canada, Limited	Hamilton, Ont.	191	1,151,000
TOTAL		615	3,484,000

Hot-Rolled Steel Products Capacity (Canada)

	Annual capacity (N. T.)
Products:	
Rails—Standard, over 60 lbs. per yard	420,000
Rails—60 lbs. or less per yard	9,500
Long Joint or Splice Bars and Tie Plate Bars	87,000
Structural Shapes—Heavy	298,000
Plates—Sheared	221,000
Plates—Universal	102,900
Hot Rolled Sheets	770,200
Coils for Cold Reduced Black Plate and Tin Plate	656,100
Hot Rolled Strip	242,000
Bars—Light Shapes	76,000
Bars—Concrete Reinforcement	246,300
Bars—All Other	751,510
Wire Rods	398,300
Skelp	148,000
Blanks, Tube Rounds or Pierced Billets for Seamless Tubes	90,000
Blooms and Billets for Forging	162,800
All Other Hot Rolled	217,200
GRAND TOTAL	4,896,810
Companies:	
Algoma Steel Corporation, Limited	940,000
Atlas Steels, Limited	112,600
Burlington Steel Company, Ltd.	64,000
Dominion Foundries and Steel, Limited	630,000
Dominion Steel & Coal Corporation, Ltd.:	
Canadian Tube & Steel Products, Limited	145,000
Dominion Iron & Steel, Limited	780,000
TOTAL	925,000
Enamel & Heating Products, Ltd.	10,000
Manitoba Rolling Mill Company, Limited	94,860
Premier Steel Mills, Limited	100,000
Sorel Industries, Limited	33,350
Steel Company of Canada, Limited	1,921,000
Vanadium Alloys Steel Canada Limited	11,000
Western Canada Steel, Limited:	
Vancouver Rolling Mills, Ltd.	55,000
GRAND TOTAL	4,896,810
Rails—Standard, over 60 lbs. per yard:	
Algoma Steel Corporation, Limited	120,000
Dominion Steel & Coal Corporation, Ltd.:	
Dominion Iron & Steel, Limited	*300,000
GRAND TOTAL	420,000
Rails—60 lbs. or less per yard:	
Algoma Steel Corporation, Limited	9,500
Long Joint or Splice Bars and Tie Plate Bars:	
Algoma Steel Corporation, Limited	28,500
Dominion Steel & Coal Corporation, Limited:	
Dominion Iron & Steel, Limited	**
Steel Company of Canada, Limited	58,500
GRAND TOTAL	87,000

* Includes rails, 60 lbs. or less and long joint or splice bars and tie plate bars.
** Included with rails.

	Annual capacity (N. T.)
Structural Shapes—Heavy:	
Algoma Steel Corporation, Limited	192,000
Dominion Steel & Coal Corporation, Ltd.:	
Canadian Tube & Steel Products, Limited	75,000
Manitoba Rolling Mill Company, Limited	10,000
Steel Company of Canada, Limited	21,000
GRAND TOTAL	298,000
Plates (Sheared and Universal):	
Algoma Steel Corporation, Limited	17,000
Dominion Foundries and Steel, Limited	70,000
Steel Company of Canada, Limited	236,900
GRAND TOTAL	323,900
Hot Rolled Sheets:	
Algoma Steel Corporation, Limited	50,000
Atlas Steels, Limited	9,600
Dominion Foundries and Steel, Limited	25,000
Steel Company of Canada, Limited	685,600
GRAND TOTAL	770,200
Coils for Cold Reduced Black Plate and Tin Plate:	
Dominion Foundries and Steel, Limited	457,000
Steel Company of Canada, Limited	199,100
GRAND TOTAL	656,100
Hot Rolled Strip:	
Algoma Steel Corporation, Limited	150,000
Atlas Steels, Limited	9,000
Dominion Foundries and Steel, Limited	65,000
Steel Company of Canada, Limited	18,000
GRAND TOTAL	242,000
Bars—Light Shapes:	
Algoma Steel Corporation, Limited	16,000
Manitoba Rolling Mill Company, Limited	15,000
Steel Company of Canada, Limited	30,000
Western Canada Steel, Limited:	
Vancouver Rolling Mills, Limited	15,000
GRAND TOTAL	76,000
Bars—Concrete Reinforcement:	
Algoma Steel Corporation, Limited	16,000
Burlington Steel Company, Limited	40,000
Canadian Tube & Steel Products, Limited (a)	35,000
Enamel & Heating Products, Limited	10,000
Manitoba Rolling Mill Company, Limited	25,000
Steel Company of Canada, Limited	90,300
Western Canada Steel, Limited:	
Vancouver Rolling Mills, Limited	30,000
GRAND TOTAL	246,300

(a) Includes bars—light shapes.

	Annual capacity (N. T.)
Bars—All Other:	
Algoma Steel Corporation, Limited	46,000
Atlas Steels, Limited	76,000
Burlington Steel Company, Limited	22,000
Dominion Steel & Coal Corporation, Limited:	
Canadian Tube & Steel Products, Limited	35,000
Dominion Iron & Steel, Limited (b)	90,000
TOTAL	125,000
Manitoba Rolling Mill Company, Limited	44,660
Premier Steel Mills, Limited (b)	100,000
Steel Company of Canada, Limited	315,200
Sorel Industries, Limited	1,650
Vanadium Alloys Steel Canada, Limited	11,000
Western Canada Steel, Limited:	
Vancouver Rolling Mills, Limited	10,000
GRAND TOTAL	751,510
Wire Rods:	
Atlas Steels, Limited	8,000
Dominion Steel & Coal Corporation, Limited:	
Dominion Iron & Steel, Limited	135,000
Steel Company of Canada, Limited	257,300
GRAND TOTAL	398,300
Skelp:	
Algoma Steel Corporation, Limited	135,000
Dominion Foundries & Steel, Limited	13,000
GRAND TOTAL	148,000
Blanks, Tube Rounds or Pierced Billets for Seamless Tubes:	
Algoma Steel Corporation, Limited	90,000
GRAND TOTAL	90,000
Blooms and Billets for Forging:	
Algoma Steel Corporation, Limited	70,000
Atlas Steels, Limited	12,000
Dominion Steel & Coal Corporation, Limited:	
Dominion Iron & Steel, Limited	40,000
Sorel Industries, Limited	31,700
Steel Company of Canada, Limited	9,100
GRAND TOTAL	162,800
All Other Hot Rolled Products:	
Burlington Steel Company, Limited	2,000
Dominion Iron & Steel, Limited	215,000
Manitoba Rolling Mill Company, Limited	200
GRAND TOTAL	217,200

(b) Includes bars—concrete reinf. and light shapes.

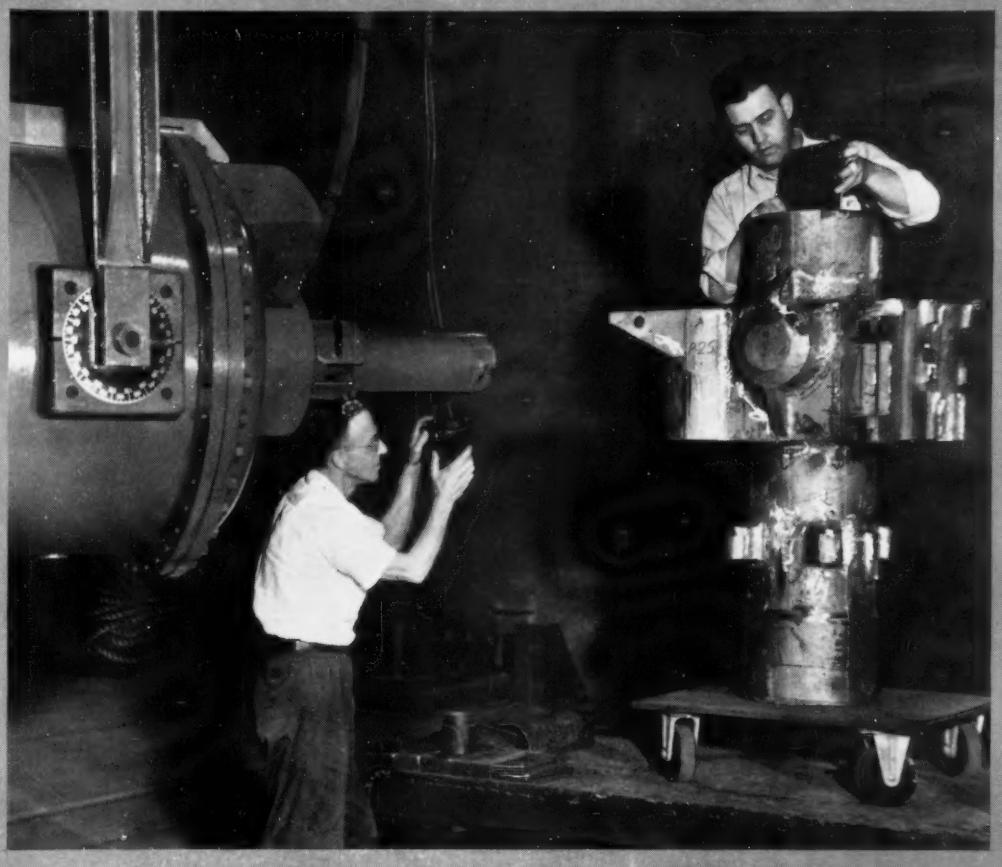
Other Finished Steel Products Capacity (Canada)

	Annual capacity (N. T.)
Products:	
Cold Finished Bars	72,000
Sheets—Cold Rolled	348,000
Sheets—Galvanized	199,000
Strip—Cold Rolled	332,800
Tin Plate—Electrolytic	244,000
Tin and Terne Plate—Hot Dipped	123,500
Splice Bars and Other Rail Joints	60,000
Tie Plates	154,000
Track Spikes	32,500
Wire—Plain	487,000
Wire—Barbed	38,000
Wire—Galvanized	85,000
Wire Nails	109,800
Wire Staples	1,470
Cut Nails	1,800
Woven Wire Fence, Netting and Reinforcing Fabric	28,500
Bale Ties	7,700
Pipe and Tubing:	
Buttweld	231,000
Electricweld	727,200
Seamless	275,000
Gasweld	3,000

	Annual capacity (N. T.)
Cold Finished Bars:	
Atlas Steels, Limited	10,000
Canadian Drawn Steel Company, Limited	32,000
Union Drawn Steel Company, Limited	25,000
Vanadium-Alloys Steel of Canada, Limited	5,000
GRAND TOTAL	72,000
Sheets—Cold Rolled:	
Algoma Steel Corporation, Limited	30,000
Atlas Steels, Limited	4,000
Dominion Foundries and Steel, Limited	40,000
Steel Company of Canada, Limited	274,000
GRAND TOTAL	348,000
Sheets—Galvanized:	
Steel Company of Canada, Limited	199,000
Strip—Cold Rolled:	
Algoma Steel Corporation, Limited	50,000
Atlas Steels, Limited	6,000
Dominion Foundries and Steel, Limited	242,000
Stanley Steel Company, Limited	20,000
Steel Company of Canada, Limited	14,800
GRAND TOTAL	332,800

	Annual capacity (N. T.)
Tin Plate—Electrolytic:	
Dominion Foundries and Steel, Limited	110,000
Steel Company of Canada, Limited	134,000
GRAND TOTAL	244,000
Tin Plate—Hot Dipped:	
Dominion Foundries and Steel, Limited	40,000
Steel Company of Canada, Limited	83,500
GRAND TOTAL	123,500
Splice Bars, Rail Joints, Tie Plates and Track Spikes:	
Algoma Steel Corporation, Limited	48,000
Dominion Steel & Coal Corporation, Limited:	
Canadian Tube & Steel Products, Limited	6,000
Dominion Iron & Steel, Limited	35,000
Steel Company of Canada, Limited	157,500
GRAND TOTAL	246,500
Wire—Plain, Galvanized and Barbed:	
Atlas Steels, Limited	5,000
Dominion Steel & Coal Corporation, Limited:	
Canadian Steel Corporation, Limited	43,600
Canadian Tube & Steel Products, Limited	37,000
Dominion Iron & Steel, Limited	95,000
Graham Nail & Wire Products, Limited	25,000
Pender & Company, Limited, James	8,000
TOTAL	208,600
Morrison Steel & Wire Company, Limited	15,000
Steel Company of Canada, Limited	301,400
GRAND TOTAL	530,000
Wire Products (Nails, Staples, Woven Fence, Netting, Reinforcing Fabric and Bale Ties):	
Dominion Steel & Coal Corporation, Limited:	
Canadian Steel Corporation, Limited	14,700
Canadian Tube & Steel Products, Limited	13,400
Dominion Iron & Steel, Limited	25,600
Graham Nail & Wire Products, Limited	11,500
Pender & Company, Limited, James	7,000
TOTAL	72,200
Morrison Steel & Wire Company, Limited	10,620
Steel Company of Canada, Limited	68,450
GRAND TOTAL	151,270

Pipe and Tubing	ANNUAL CAPACITY (N. T.)			
	Buttweld	Seamless	Electric-weld	Gasweld
Companies:				
Alberta Phoenix Tube & Pipe, Limited	....	....	100,000	....
Atlas Steels, Limited	....	....	200	....
Barton Tubes, Limited	....	....	12,000	....
Burlington Steel Company, Limited	....	....	....	3,000
Canadian Western Pipe Mills, Limited	....	....	60,000	....
Dominion Steel & Coal Corporation, Limited:				
Canadian Tube & Steel Products, Limited	30,000	....	....	....
Mannesmann Tube Company, Limited	....	225,000	....	....
Page-Hersey Tubes, Limited	150,000	50,000	215,000	....
Standard Tube & T. I., Limited	....	....	40,000	....
Steel Company of Canada, Limited	51,000	....	....	....
Welland Tubes, Limited	....	....	300,000	....
TOTAL	231,000	275,000	727,200	3,000



Watchdog on mounting costs

PRICES of common materials keep going up. Many new alloys are costly. Hence, rough castings become more expensive.

Even more, the cost of machining time keeps mounting. No one can afford to have it wasted by waiting for the tool to locate a void or defect.

So now is a good time to re-examine the importance of radiography. To suppliers it gives the assurance that only a quality product is delivered. To processors it gives the confidence that man and machine time will be productive—not wasted.

Today, million-volt x-ray equipment radiographs heavier parts with shorter exposures. The use of radioactive isotopes makes possible a radiographic department at moderate cost. And the new Kodak Industrial X-ray Film Type AA—with up to twice the speed of the previous film—widens the scope of all radiographic equipment.

If you would like to know how radiography can save you money—how it can keep the quality of castings high—have a serious talk with your Kodak x-ray dealer or Kodak technical representative.

EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, N. Y.

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"RESTRICTED SPECIFICATION" COLD ROLLED STRIP STEEL

Metal fabricators who rely on CMP for cold rolled strip steel enjoy the comfortable feeling of knowing that no better source exists for specialty strip products.

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CMP does exactly that. Customers' orders involving restricted specifications can be processed at any one of three CMP plants with assurance of duplication of quality and processing and uniformity of result.

Your inquiries will be welcome, too.

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CMP STRIP STEEL

STEEL

June 3, 1957

Market Outlook

INCREASING gaps in consumers' inventories, combined with renewed emphasis by producers that prices will be increased in July, are contributing to a slight upturn in June steel specifications.

QUICK DELIVERY—Most mills have open tonnage to offer for shipment this month, including sheets, strip, bars, wire products, commercial pipe and even light shapes and strip-plate.

They can handle the slight bulge in June specifications without any particular difficulty. Prompt deliveries are possible because some producers have stocks of steel processed slightly beyond the semifinished stage, so they can narrow the gap between receipt of an order and shipment.

TIGHT ITEMS—All products are not readily available from mills. Some producers are booked up solidly well into the third quarter on sheared plates, wide flange structurals, tin plate, some sizes of oil country pipe and certain specialties —notably high silicon sheets for heavy electrical equipment applications.

But light-gage plates are becoming noticeably plentiful, and pressure for structurals has eased somewhat. In April, structural bookings reached a peak for the first four months this year at 360,351 net tons. But the total for the period (1,212,977 tons) was off 18 per cent from the year-ago mark. This, in part, explains increasing competition among fabricators for new jobs.

OPERATIONS RISE—Reflecting the slight improvement in June specifications, steelmaking operations last week went up 2 points, the national ingot rate rising to 86 per cent of capacity. This is equal to a weekly output of about 2,201,161 net tons. A year ago, operations averaged 96.5 per cent, equal to 2,275,726 tons.

Reversal of the downtrend in the ingot rate, while encouraging, is not particularly significant. Just ahead is the vacation season. Suspensions at some fabricating plants will be more extended than usual. This means less pressure for steel in the early weeks of summer. Steelmakers will make equipment repairs during the lull.

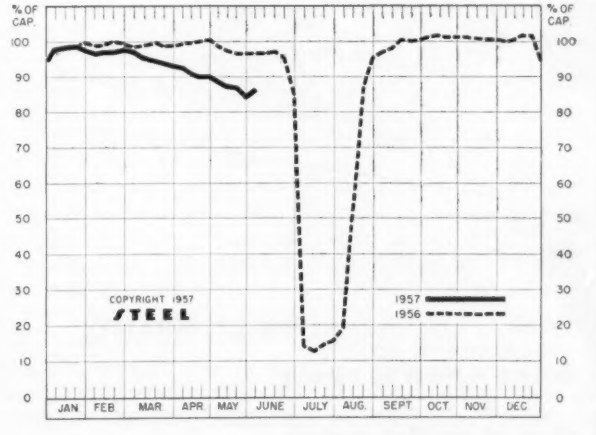
AUTOS STILL LAG—Indications are there won't be much additional buying on automotive account this quarter. In fact, there probably won't be much until late third quarter when 1958 model runs get under way.

Demand from the auto industry has been particularly disappointing to steelmakers. The market just hasn't measured up to predictions. (Now it looks as though the industry will at least equal last year's output of 5.8 million passenger cars and 900,000 trucks.)

PRICES—With steel wages scheduled to rise an estimated 20 cents an hour July 1, it is almost a foregone conclusion that a compensating price increase will follow. Talk has been in terms of $5 to $7 a ton. Some steelmakers appear to think an even stiffer rise is justified.

Steel prices are holding right now. STEEL's arithmetical average on finished steel is unchanged at $140.24, compared with $139.71 a month ago, $128.98 a year ago and $106.32 five years ago. Scrap continues the recovery it started several weeks ago. Last week, the index on the steelmaking grades advanced another 33 cents to $47, the highest figure since March.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended June 2	Change	Same Week 1956	Same Week 1955
Pittsburgh	89.5	— 0.5*	98	97
Chicago	89	+ 1*	100.5	99.5
Mid-Atlantic	94	0	98	96.5
Youngstown	70	—11	101	96
Wheeling	81.5	— 3	100.5	93
Cleveland	86	+ 2*	95.5	101
Buffalo	95	+42.5	105	104.5
Birmingham	92.5	0	23.5	96
New England	56	0	89	90
Cincinnati	85	+ 5	96	85
St. Louis	90	+ 5.5	96.5	92
Detroit	87	+ 6.5	96	94
Western	100	0	107	104
National Rate	86	+ 2	96.5	96.5

INGOT PRODUCTION‡

	Week Ended June 2	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	139.8†	137.7	138.6	147.5
NET TONS (In thousands)	2,246†	2,212	2,226	2,370

*Change from preceding week's revised rate.
†Estimated. ‡Amer. Iron & Steel Institute.
Weekly capacity (net tons): 2,559,490 in 1957; 2,461,893 in 1956; 2,413,278 in 1955.

Metalworking Outlook—p. 45

Technical Outlook—p. 83

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THIS IS OUR LABORATORY REPORT on one customer's order for Alloymet nickel base pig and shot* for stainless steel production.

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These alloys of certified analysis are available at approximately 5% over the cost of nickel alloy scrap.

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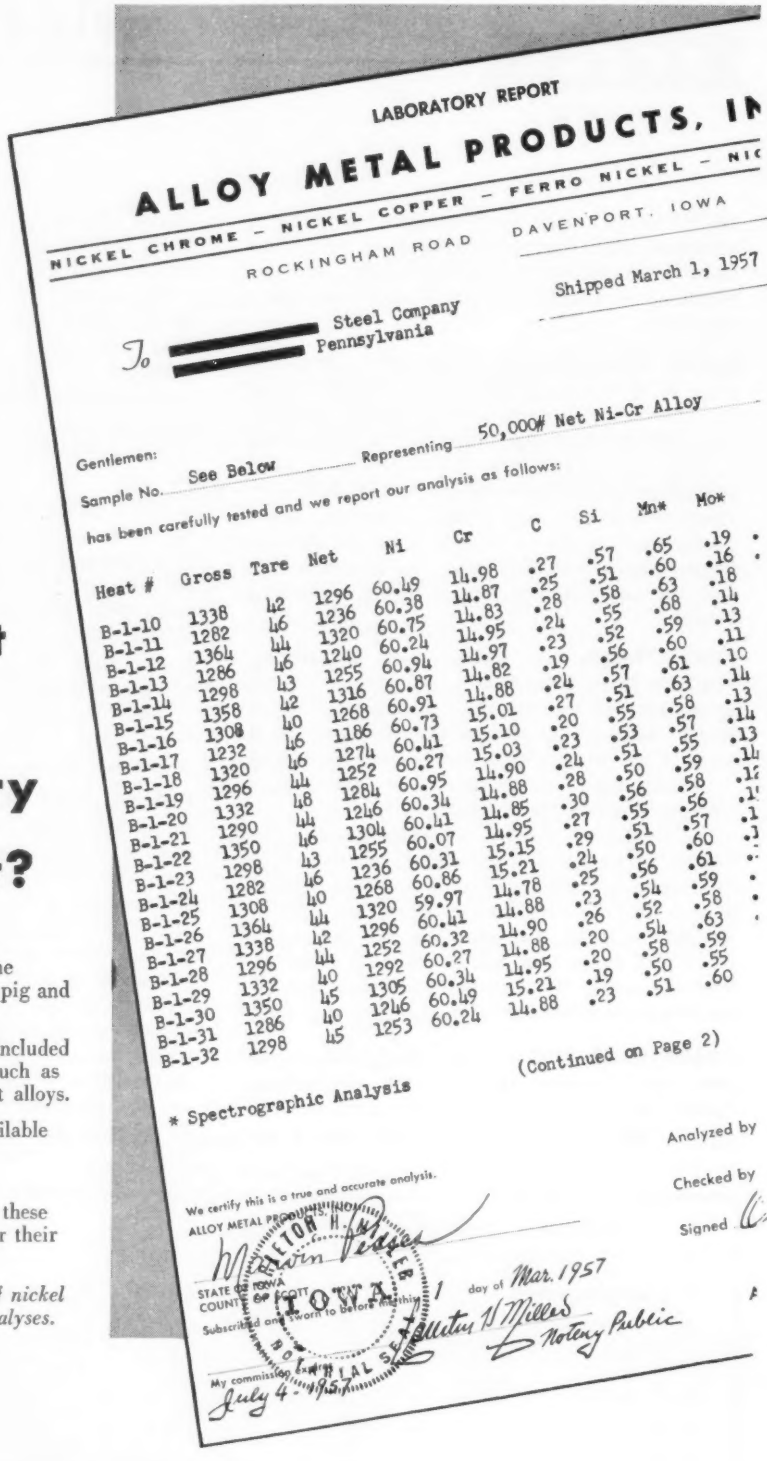

LABORATORY REPORT

ALLOY METAL PRODUCTS, IN

NICKEL CHROME – NICKEL COPPER – FERRO NICKEL – NIC

ROCKINGHAM ROAD DAVENPORT, IOWA

To [redacted] Steel Company
Pennsylvania

Shipped March 1, 1957

Gentlemen:

Sample No. See Below Representing 50,000# Net Ni-Cr Alloy

has been carefully tested and we report our analysis as follows:

Heat #	Gross	Tare	Net	Ni	Cr	C	Si	Mn*	Mo*
B-1-10	1338	42	1296	60.49	14.98	.27	.57	.65	.19
B-1-11	1282	46	1236	60.38	14.87	.25	.51	.60	.16
B-1-12	1364	44	1320	60.75	14.83	.28	.58	.63	.18
B-1-13	1286	46	1240	60.24	14.95	.24	.55	.68	.14
B-1-14	1298	43	1255	60.94	14.97	.23	.52	.59	.13
B-1-15	1358	42	1316	60.87	14.82	.19	.56	.60	.11
B-1-16	1308	40	1268	60.91	14.88	.24	.57	.61	.10
B-1-17	1232	46	1186	60.73	15.01	.27	.51	.63	.14
B-1-18	1320	46	1274	60.41	15.10	.20	.55	.58	.13
B-1-19	1296	44	1252	60.27	15.03	.23	.53	.57	.14
B-1-20	1332	48	1284	60.95	14.90	.24	.51	.55	.13
B-1-21	1290	44	1246	60.34	14.88	.28	.50	.59	.11
B-1-22	1350	46	1304	60.41	14.85	.30	.56	.58	.12
B-1-23	1298	43	1255	60.07	14.95	.27	.55	.56	.11
B-1-24	1282	46	1236	60.31	15.15	.29	.51	.57	.1
B-1-25	1308	40	1268	60.86	15.21	.24	.50	.60	.1
B-1-26	1364	44	1320	59.97	14.78	.25	.56	.61	.1
B-1-27	1338	42	1296	60.41	14.88	.23	.54	.59	.
B-1-28	1296	44	1252	60.32	14.90	.26	.52	.58	.
B-1-29	1332	40	1292	60.27	14.88	.20	.54	.63	.
B-1-30	1350	45	1305	60.34	14.95	.20	.58	.59	
B-1-31	1286	40	1246	60.49	15.21	.19	.50	.55	
B-1-32	1298	45	1253	60.24	14.88	.23	.51	.60	

(Continued on Page 2)

* Spectrographic Analysis

Analyzed by

Checked by

We certify this is a true and accurate analysis.
ALLOY METAL PRODUCTS, INC.

Signed

STATE OF IOWA
COUNTY OF SCOTT

Subscribed and sworn to before me this 1 day of Mar. 1957

NOTARIAL SEAL

Notary Public

My commission expires July 4 1957

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(FORMERLY A DIVISION OF **ALTER COMPANY**)
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DAVENPORT, IOWA

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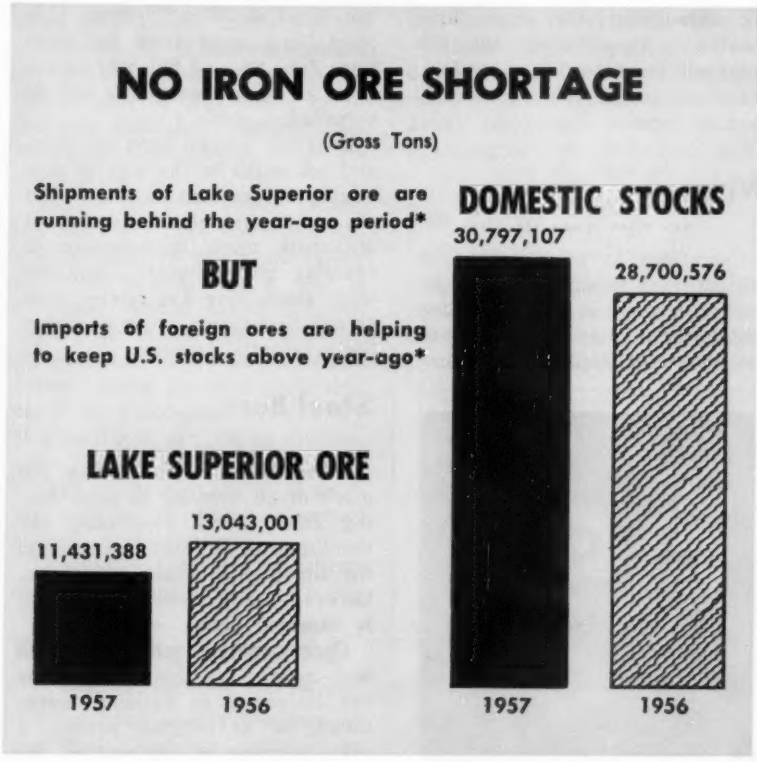

*Shipments are cumulative to May 19 of each year. Stocks are as of Apr. 1.
Source: Lake Superior Iron Ore Association.

Imports Fill Ore Gap

U.S. steelmakers depend less on diminishing sources of direct shipping grades. But foreign ores and agglomerates assure them of adequate future supplies

SHIPMENTS of iron ore from the Lake Superior region are running 12.4 per cent behind the 1956 pace. Not too long ago, such a statement would have sent purchasing agents scurrying to make sure steelmakers would have enough raw materials to keep the furnaces going through next winter. Today, it doesn't worry anybody because U.S. stocks are still 7.3 per cent above the year-ago level.

Two developments account for this happy position: 1. Importation of high-grade foreign ores is increasing. 2. Agglomerates (taconite and jasper) are emerging from the pilot plant stage to full production status. Last year, the Lake Superior region accounted for about 58 million gross tons of our 129 million tons of ore, agglomerates another 5 million tons, imports 30 million tons. By 1980, H. S. Harrison, vice president of Cleveland-Cliffs Iron Co., Cleveland, estimates that total supply will be about 185 million gross tons. Only 20 million tons will be Minnesota standard grade; 50 million will be taconites and jaspers; and 75 million will be foreign.

Plenty Here—If need be, America could still produce all the ore we need. The taxable reserves of commercial (direct shipping) ore in the Upper Lakes area are estimated at over 1 billion tons. In addition, Mr. Harrison estimates that in the Lake Superior region alone there are over 24 billion tons of crude ore, which when treated, will produce over 8 billion tons of usable furnace product. "This, judging by the past, is enough to last the furnaces over 200 years," he states.

This estimate will grow as reserves of high grade ore diminish and methods of beneficiating even lower grade ores are developed. When asked what is the lowest iron content that can be considered as iron ore, G. W. Humphrey, vice president, M. A. Hanna Co., Cleveland, answered: "Our concept along that line has changed with each new technique of upgrading low ores. Generally, iron ore is anything you can mine and ship to make iron economically at any given time."

Money Matter—That word "economically" is the crux. Just after the turn of the century, according to Mr. Harrison, Cleveland-Cliffs opened an underground mine of 1 million ton capacity for less than $1 million. Today, that same mine would cost about $15 million. Low grade deposits cost much more. When the Erie Mining Co. reaches 10 million annual capacity (taconite), it will cost nearly $350 million, or about $35 an annual ton of capacity including all supporting facilities.

But the fears that existed only a comparatively short time ago about our source of iron ore are almost nonexistent. If we should ever be separated from our foreign supplies, it would become economically feasible to supply all we need from our own backyard.

Pig Iron . . .

Pig Iron Prices, Page 149

Blast furnace production (pig iron and ferroalloys) totaled 6,870,886 net tons in April, reports the American Iron & Steel Institute. Of the total, 6,810,102 tons were pig iron, and 60,784 tons were ferromanganese and spiegeleisen. In the like month a year ago, output was 6,924,563 net tons (6,860,833, pig iron; 63,730, ferroalloys).

Cumulative output in the first four months this year was 28,056,-

641 tons (27,793,279, pig iron; 263,362, ferroalloys). The total for the like period of 1956 was 27,726,387 tons (27,469,854, pig iron; 256,533, ferroalloys).

Merchant pig iron shipments remain light. Foundries are buying cautiously because of uncertainty as to their customers' requirements over the summer months when many plants will have vacation shutdowns. Vacations this year at foundries will be longer.

Producers look for a continued lag throughout the next three months. They believe the low point will be reached in early July. Many are taking this opportunity to make repairs.

Wire . . .

Wire Prices, Pages 146 & 147

Operations at some wire mills are expected to slip below 60 per cent of capacity in June, and drop still lower in July. In the East, the Worcester plant of the American Steel & Wire Division, U.S. Steel Corp., goes down for vacations June 28, and finishing operations at other area plants will be curtailed.

Bookings beyond June are light, and not much in the way of new buying is expected in July. For the most part, producers do not anticipate much improvement in ordering until August. By that time, automotive and related lines should be returning to the market for substantial tonnage.

New EASTERN
CAR SHAKERS

Bulk materials shipped in hopper bottoms and other open top railroad cars are unloaded easily with the aid of EASTERN'S new Car Shaker. Utilizing both impact and vibration, this new product incorporates the best features of earlier models to produce a more efficient operation. Its practical design and rugged construction have made it simple to operate and economical to use.

Write for Bulletin 55

EASTERN
CONSTRUCTORS, INC.
Poland, Ohio

Steel Bars . . .

Bar Prices, Page 144

The bar mills don't look for much of an upswing in sales during June. Some purchasing for third quarter is noted, but demand for the period is not impressive. Generally, not much new buying is expected before August.

Consumers' requirements are well covered for this month. Few are interested in building inventories, or in hedging against a price increase at the end of the month. Protective buying is of little consequence. What there is of it probably is at the expense of July volume.

A few spot purchases on defense account are reported. The Navy is closing on 440 tons of hot bars for delivery at Philadelphia, and the Watertown, Mass., arsenal is in the market for 950 tons for remelting.

Cold-drawn bar mill operations may pick up a little over the next few weeks.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 145 & 146

Sheet steel buying continues to be spotty. But the market tone appears to be a little firmer, and a slight improvement in June specifications is noted at several market centers.

Most buying by auto builders and appliance manufacturers for the third quarter is about completed. Cold-rolled sheetmakers expect to receive a few orders from automakers before production begins on 1958 models. But it is not thought that there will be much stocking of tonnage pending completion of present model schedules.

There has been a little protective covering to beat a price ad-

vance at midyear. Indications are such covering is at the expense of third quarter delivery business. As a result of the moving up of business from July, carbon sheet and strip bookings for June are slightly heavier.

Except for high silicon sheets, the mills still have tonnage available for delivery this month. Even hot-rolled sheets, which are in strongest demand among the tonnage items in the light flat-rolled category, can be had in the lighter gages. About the only grade that can't be purchased for delivery this quarter is high silicon sheets—some producers are practically booked up through the third quarter because of heavy electrical equipment requirements.

Demand for galvanized sheets continues disappointing.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 144

Reinforcing steel fabricators on the West Coast are disturbed by unconfirmed reports that some out-of-district interests are actively bidding on pending school and highway construction jobs in California. It is said that bids are being entered by firms as distant as Chicago.

Plates . . .

Plate Prices, Page 144

Producers of heavy gage sheared plates are booked well into the third quarter, and they do not anticipate any particular easing in their supply position in the period. The pressure for ship plate and line pipe requirements is particularly strong. Warehouses are pressing for all the heavy gage tonnage they can obtain.

The supply of light gage plates is definitely easier. Strip mill production of plates up to ½-in. is rapidly filling gaps in inventories. On the average, light plate tonnage is available in three to four weeks. Warehouse stocks are reported to be comfortable.

New England suppliers report deliveries of clad plates and flanged work, including pressed heads, are improving. Light and narrow plates, 72 in. and under, are in ample supply in the area for the third quarter. In fact, all available tonnage is not being taken.

Pressure from the petroleum industry has eased a little, and demand from some segments of the heavy equipment industry is not so strong as it was some time back.

Tin Plate . . .

Tin Plate Prices, Page 146

Metal can shipments in March totaled 323,791 tons, reports the U.S. Census Bureau. This was up from shipments in February (280,395 tons) but it was down from those in March, 1956 (341,237 tons.

Shipments of fruit and vegetable cans in March totaled 68,407 tons, compared with 63,695 in February this year and 72,353 in March a year ago. The first quarter total in this classification was 202,085 tons, against 200,081 in the like period last year.

Beer can shipments (second largest classification) were 51,798 tons in March, against 43,402 in

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. . . a fast, economical method for producing a specified case depth

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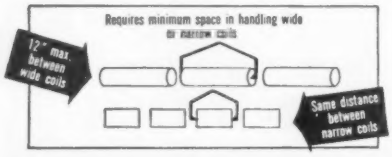

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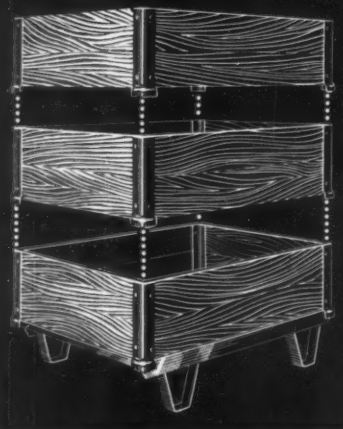

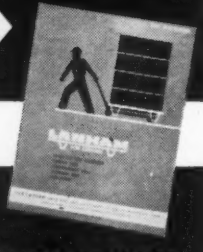

THE LANHAM SKID CO.

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February this year and 60,397 in March, 1956. For the first three months the total was 154,152 tons, against 148,758 in the like period a year ago.

Structural Shapes . . .

Structural Shape Prices, Page 144

Structural steel bookings in April of 360,351 tons reached a new peak for the first four months, according to the American Institute of Steel Construction. Shipments were at a new high for the period at 313,591 tons.

Total bookings for January through April of 1,212,977 tons were off 18 per cent from those in the corresponding period of 1956 when 1,481,347 tons were placed. Shipments during the period were up 2 per cent at 1,159,230 tons, against 1,133,254 in the like period of last year.

Order backlogs at the end of April were 3,416,778 tons. This was a decrease of 38,000 tons from the preceding month.

Bridge work features the structural steel market, but activity is becoming slightly more diversified at some points. In the Philadelphia market, for instance, a pickup in orders is noted.

Competition among fabricators is keen, particularly among the smaller interests. Most fabricators are booked well ahead, but their backlogs have been shrinking recently, and competition for jobs has increased noticeably.

Considerable public work is active, including 18,000 tons for ten bridges for New York state on which bids open June 6.

New England fabricators report that bridge requirements are less than they were a year ago. Current inquiries and contracts involve about 12,000 tons.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 147

Demand for industrial fasteners is sluggish. Automotive requirements are limited and the usual seasonal improvement in sales on railroad and construction accounts wasn't up to expectations. Slow buying is traced to high inventories. Producers say there has been a little protective buying in anticipation of higher prices this summer.

PLATES . . .

PLATES PLACED

600 tons, ¼-in. water system replacement, Port Townsend, Wash., to Hydraulic Supply Mfg. Co., Seattle, low at $195,167.

600 tons, five underground storage tanks, Naval air base, Adak, Alaska; subcontract to the Commercial Steel Fabricators Inc., Seattle.

PLATES PENDING

1200 tons, 6.5 miles of ¼-in. plate, 28-in. steel water pipe; also alternatives; bids to Vic Lindberg, comptroller, Aberdeen, Wash., June 5.

900 tons, hull plates, carbon and alloy, General Stores Supply, Navy, Philadelphia.

125 tons, 500,000-gal water storage tank, Colorado river project, Flaming Gorge, Utah; bids to chief engineer, Bureau of Reclamation, Denver.

105 tons, fuel storage tanks, Bucks Harbor, Me., AFB; bids about June 15, Corps of Engineers, Boston.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

16,600 tons, second Narrows bridge, Vancouver, B.C., to Dominion Bridge Co. Ltd., Vancouver, B.C.

7200 tons, state bridge work, Roosevelt boulevard, Philadelphia, through McCloskey & Co., Philadelphia, to the Bethlehem Steel Co., Bethlehem, Pa.

6000 tons, plant expansion, Lukens Steel Co., Coatesville, Pa., through United Engineers & Constructors Inc., to Belmont Iron Works, Eddystone, Pa.

4500 tons, Ft. Pitt tunnel work, Allegheny county, Pennsylvania, through Merritt, Chapman & Scott, New York, to the Commercial Shearing & Stamping Co., Youngstown.

4300 tons, transformer plant, Westinghouse Electric Corp., Athens, Ga., to American Bridge Division, U.S. Steel Corp., Pittsburgh; Daniel Construction Co., Greenville, S.C., general contractor.

3700 tons, state bridge work, University avenue, Philadelphia, through the Kaufman Construction Co., Philadelphia, general contractor, to the Ingalls Iron Works Co., Birmingham.

3300 tons, Burrard office building, Vancouver, B.C., to Western Bridge & Steel Fabricators Ltd., Vancouver, B.C.

3076 tons, government bridge, Nelson, B.C., to the Western Bridge & Steel Fabricators Ltd., Vancouver, B.C.

3000 tons, Pacific Great Western Railway bridge, Ft. St. John, B.C., to Dominion Bridge Co. Ltd., Vancouver, B.C.

2000 tons, Oak street bridge, Vancouver, B.C., to Dominion Bridge Co. Ltd., Vancouver, B.C.

2000 tons, B.C. Forest Products pulp mill, Crofton, Vancouver Island, to Dominion Bridge Co. Ltd., Vancouver, B.C.

1450 tons, plus doors and equipment, aircraft shelters at Geiger, Glasgow, Malmstrom and Klamath airports, Montana, Washington and Oregon, to the Pacific Iron & Steel Corp., Los Angeles, low complete bid at $1,143,744 to the U.S. Engineer, Walla Walla, Wash.

1400 tons, hangar, American Airmotive Lines, International Airport, Miami, Fla., to Erwin-Newman Co., Houston; Fred Howland Inc., Miami, general contractor; reinforcing to the Ludlman Steel Co., Miami.

1400 tons, North Shore Shopping Center, Allied Stores Corp., Peabody, Mass., to Macomber Construction Co., Canton, O.; John A. Volpe Construction Co., Malden, Mass., general contractor.

1314 tons, Pacific Great Western Railway bridge, to Western Bridge & Steel Fabricators Ltd., Vancouver, B.C.

1270 tons, distribution center buildings, International Harvester Co., Columbus, O., to owner's shops; Wisconsin Steel Division, Chicago; G. W. Atkinson Co., Columbus, general contractor; 95 tons, reinforcing, to Pollak Steel Co., Cincinnati.

1200 tons, four bridges, Atlanta North-South expressway, Fulton county, Ga., to Bristol Steel & Iron Works, Bristol, Va.; bids direct.

1100 tons, state bridge work, York county, Pa., through Nello L. Teer Co., Durham, N.C., general contractor, to Phoenix Bridge

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for strip-mine shovels
and drag lines;
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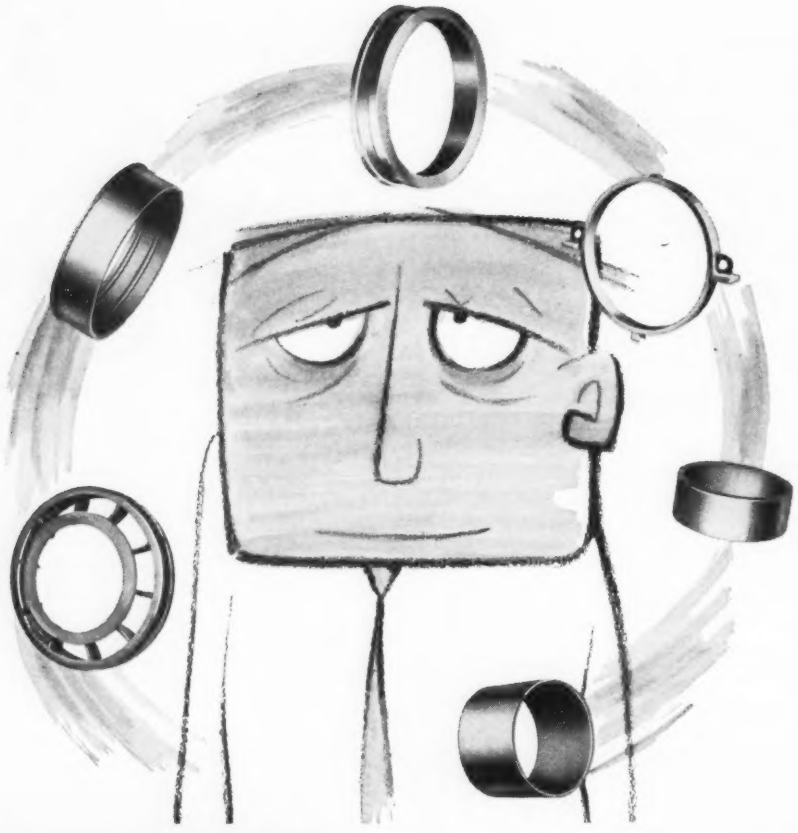

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Because Cleve-Weld parts are designed close to finish dimensions, you can plan on cost reduction in three important areas:

1. Cut machining waste up to 30%.
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Where titanium and other "wonder metals" are specified, Cleve-Weld circular components practically pay for themselves in material and machining time savings.

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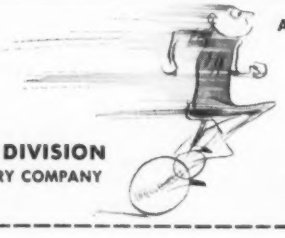

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TITLE_____

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Works, Phoenixville, Pa.

858 tons, B.C. Electric Co.'s turbine plant, Port Mann, B.C., to Western Bridge & Steel Fabricators Ltd., Vancouver, B.C.

650 tons, five state bridges, Division street project, Pawtucket, R.I., to Tower Iron Works, Providence, R.I.; bids direct.

575 tons, Warrior River High School, Watsontown, Pa., to Goetz Welding Co., Harrisburg, Pa.

500 tons, structurals and bars, four dormitories, Andrews AFB, Maryland, to Potomac Steel Co. (structurals), and Warsaw Steel Co. (reinforcing), both Hyattsville, Md.; Wertheimer Construction Co., Arlington, Va., general contractor.

500 tons, lower gate and floating bulkhead, Wilson lock, Muscle Shoals, Ala., Tennessee Valley Authority, to Nashville Bridge Co., Nashville, Tenn., and Ingalls Iron Works, Birmingham.

500 tons or more, two 250-ton power house cranes, to the Pacific Coast Engineering Co., Alameda, Calif., at $498,000; 150-ton deck gantry crane to American Hoist Pacific Inc., Seattle, at $264,971; 80-ton draft tube gantry, to Moffett Engineering Co., Albany, low at $152,000, by Chelan county, P.U.D. No. 1, Wenatchee, Wash.

500 tons, boiler supports, Combustion Engineering Co., Mooringsport, La., to the Maxwell Steel Co.

500 tons, Lane county, Oregon, courthouse, to Lewis Riffel Inc., Portland, Oreg., low at $177,358.

400 tons, maintenance hangar, NAS, New Iberia, La., to the Industrial Steel Products Co. Inc., New Orleans; Southern Builders Inc., Shreveport, La., general contractor; 50 tons, reinforcing bars, to Southwest Steel Products, New Orleans.

400 tons, high school, Steelton, Pa., to Dauphin Steel Co., Harrisburg, Pa.

385 tons, municipal auditorium, Vancouver, B.C., to Western Bridge & Steel Fabricators Ltd., Vancouver, B.C.

375 tons, Eastridge High School, Irondequoit, N.Y., to F. L. Heughes & Co., Rochester, N.Y.

365 tons, galvanized steel towers, Northwest Telephone Co.'s microwave project, to Western Bridge & Steel Fabricators Ltd., Vancouver, B.C.

300 tons, state bridge, Duchess county, New York, through John Arboria Inc., general contractor, to the Bethlehem Steel Co., Bethlehem, Pa.

271 tons, state bridge work, Passaic county, New Jersey, through Mal Bros. Contracting Co., general contractor, to the Elizabeth Iron Works Inc., Union, N. J.

245 tons, bottling and distributing plant, Allegheny county, Pennsylvania, for the Metropolitan Bottling Co. Inc., New York, to the South Hills Ornamental Co.

235 tons, three autoclaves, Johns-Manville Corp., Manville, N. J., to the Blaw-Knox Co., Pittsburgh.

207 tons, Kelowna bridge, to Western Bridge & Steel Fabricators Ltd., Vancouver, B.C.

180 tons, Lyman C. Hunt junior high school, Burlington, Vt., to Vermont Structural Steel Co., Burlington; H. P. Cummings Construction Co., Woodsville, N. H., general contractor.

135 tons, administration and service building, Forrestal Research Center, Princeton, N. J., through Gibbs & Hill, to unnamed fabricator.

165 tons, regional high school, Athol, Mass., to Holyoke Iron Co., Holyoke, Mass., through Daniel O'Connell's Sons Co., Holyoke, general contractor.

130 tons, Fine Arts Building, State Teacher's College, New Haven, Conn., to Kramer Iron Works, New Haven, through Barba & Cinmino, Hamden, Conn., general contractor.

120 tons, state bridge work, St. Lawrence county, New York, through Merritt, Chapman & Scott, New York, to the Dominion Bridge Co. Ltd., Montreal, Canada.

113 tons, sheaves and bearings for bridge repairs for the Pennsylvania Railroad at Chicago, to the Seaboard Structural Steel Co.

100 tons, state highway bridge, Albany county, N. Y., to Ernst Steel Corp., Buffalo, through Westcott Construction Co., North Attleboro, Mass., general contractor.

STRUCTURAL STEEL PENDING

4800 tons, Naval hospital, Portsmouth, Va., Tishman Construction Co., New York, low on base bid.

1000 tons, trashracks, guides, etc., Rocky Reach power plant, Wenatchee, Wash.; Commercial Steel Fabricators Inc., Seattle, low at $405,336.

700 tons, also 170 tons of reinforcing, Santiam river, Oregon, state highway bridge, general contract to Donald M. Drake Co., Portland, Oreg., low at $703,505.

465 tons, single span plate girder bridge, Shetucket river, Norwich, Conn.; bids June 3, Hartford, Conn.; also 60 tons reinforcing bars.

450 tons, state bridge work, Camden county, New Jersey; bids June 11. Also, 356 tons of reinforcing steel.

125 tons, substation work, New York State Power Authority, Barnhart, N. Y.; S.A.E., Milan, Italy, low bidder.

150 tons, four Delta river valley bridges, Alaska, 560 ft, total length; Nygren Construction Co., Seattle, low at $391,710 to the Bureau of Public Roads.

120 tons, twin span rolled beam bridge, Salisbury, Conn.; bids June 3, Hartford, Conn.; also 75 tons of reinforcing bars.

100 tons, pedestrian overpass, Morrissey boulevard, Dorchester district, Boston.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2100 tons, North Shore Shopping Center, Allied Stores Corp., Peabody, Mass., to Concrete Steel Co., Boston; John A. Volpe Construction Co., Malden, Mass., general contractor.

2100 tons, state bridge work, Roosevelt boulevard, Philadelphia, through McCloskey & Co., Philadelphia, to Sweets Steel Co., Williamsport, Pa.

1700 tons, high school, Broad and Green streets, Philadelphia, through McCloskey & Co., general contractor, Philadelphia, to American Steel Engineering Co., Philadelphia.

1500 tons, flood control project, schedules 1 and 2, North Adams, Mass., to Igoe Bros. Inc., Newark, N.J.; Carlo Bianchi & Co., Framingham, Mass., general contractor.

1300 tons, nose hangar, National Air Lines, International Airport, Miami, Fla., to Joseph H. Fox Co., Birmingham, Ala.; Fred Howland Inc., Miami, general contractor; structurals, Sheffield Steel Co., Birmingham.

1235 tons, 3.45 miles of Northern Illinois toll highway, contract T-5A, Lyons township, Cook county, Ill., for Illinois State Toll Highway Commission, Chicago; bids June 6.

300 tons, flight facilities, Boeing Field, Seattle, to the Northwest Steel Rolling Mills Inc., Seattle; S. Fiorito, Seattle, general contractor.

275 tons, transformer plant, Westinghouse Electric Corp., Athens, Ga., to Connors Steel Division, H. K. Porter Co. Inc., Birmingham, Ala.; Daniel Construction Co., Greenville, S.C., general contractor.

265 tons, 1.9 miles of Tri-State route, Northern Illinois toll highway, contract T-5B, Lyons and Provise townships, Cook county, Ill., for Illinois State Toll Highway Commission, Chicago; bids June 6.

210 tons, library-classroom building, Connecticut Teachers' College, New Britain, Conn., to Scherer Steel Co., Hartford, Conn.; Hayes Construction Co., New Britain, general contractor.

187 tons, 3.67 miles of Northern Illinois toll highway, contract E-1A, Sugar Grove and Aurora townships, Kane county, Ill., for Illinois State Toll Highway Commission, Chicago; bids June 6.

180 tons, regional high school, Athol, Mass., to Northeastern Steel Products Co., Boston, through Daniel O'Connell's Sons Co., Holyoke, Mass., general contractor.

175 tons, two bridges over Reading railroad (at Broad street and at Twenty-first street, Philadelphia), through Kaufman Construction Co., general contractor, Philadelphia, to American Steel Engineering Co., Philadelphia.

175 tons, Y.M.C.A. building, Yakima, Wash., to the Northwest Steel Rolling Mills Inc., Seattle.

135 tons, school building, Haverhill, Mass., to Concrete Steel Co., Boston; Sawyer Construction Co. Inc., Burlington, Mass., general contractor; structurals went to American Architectural Iron Co., Boston.

Imported Steel

Prices per 100 lbs. (except where otherwise noted) landed, including customs duty, but no other taxes.

	Atlantic & Gulf Coast	West Coast	Vancouver	Montreal
Deformed Bars (⅝" Dia. incl. all extras)	$7.13	$7.36	$7.02	$6.76
Merchant Bars (¼" Round incl. all extras)	7.67	7.90	7.53	7.27
Bands (1"x⅛"x20' incl. all extras)	7.81	8.03	7.70	7.43
Angles (2"x2"x¼" incl. all extras)	6.77	7.00	7.21	6.93
Beams & Channels (base)	7.17	7.41	7.67	7.45
Furring Channels (C.R. ¾", per 1000')	26.62	27.77	32.70	31.60
Barbed Wire (per 82 lb. net reel)	6.95	7.40	7.75	7.80
Nails (bright, common, 20d and heavier)	8.38	8.58	9.07	8.99
Larssen Sheet Piling (section II, new, incl. size extra)	7.80	8.10	8.10	7.80
Wire, Manufacturer's, bright, low C, (11½ ga.)	7.38	7.52	8.52	8.52
Wire, galvanized, low C, (11½ ga.)	8.01	8.15	9.42	9.42
Wire, Merchant quality, bl. ann., (10 ga.)	7.60	7.75	8.78	8.78
Rope Wire (.045", 247,000 PSI, incl. extras)	13.60	13.75	13.00	13.00
Wire, fine and weaving, low C, (20 ga.)	10.66	10.80	10.17	12.17
Tie Wire, autom. baler (14½ G, 79 lbs. net)	7.81	7.96	7.77	7.77
Merchant Pipe (½" galv. T & C, per 100')	8.64	9.11	...	...
Casing (5½", 15.5 J55, T & C, per 100')	194.00	199.00	...	...
Tubing (2⅞", 6.4 J55, EUE, per 100')	103.00	104.00	...	...
Forged R. Turn. Bars, C-1035 (from 10" dl.)	14.00	14.23	14.00	13.74

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120 tons, office building, Paul Revere Life Insurance Co., Worcester, Mass., to Northern Steel Inc., Medford, Mass., through George A. Fuller Co., Boston, general contractor.

115 tons, shop buildings, Waterbury Farrel Foundry & Machine Co., Cheshire, Conn., to U.S. Steel Supply Division, U.S. Steel Corp., Boston; George A. Fuller Co., Boston, general contractor.

80 tons, Washington state highway project, Keechelus Lake, to James D. English Steel Co., Tacoma, Wash.

REINFORCING BARS PENDING

2925 tons, 0.39 mile of Northern Illinois toll highway, contract E-1B, Aurora township, Kane county, Ill., for Illinois State Toll Highway Commission, Chicago; bids May 29.

1000 tons, 2.98 miles of east-west tollway, Northern Illinois toll highway, contract T.6A, York township, DuPage county, Ill., for the Illinois State Toll Highway Commission, Chicago; bids June 13.

913 tons, 5.009 miles of Northern Illinois toll highway, contract T-1C, Thornton and Bremen townships, Cook county, Ill., for the Illinois State Toll Highway Commission, Chicago; bids June 13.

852 tons, 3.73 miles of tri-state tollway, Northern Illinois toll highway contract T-3A, Palos and Lyons townships, Cook county, Ill., for the Illinois State Toll Highway Commission, Chicago; bids June 13.

770 tons, 3.385 miles, Northern Illinois toll highway, contract T-1A, Thornton and Bremen townships, Cook county, Ill., for the Illinois State Toll Highway Commission, Chicago; bids June 13.

300 tons, hospital addition, Bellingham, Wash.; bids in.

270 tons, first phase of state freeway project, Pierce county, Washington; general contract to Woodworth & Co., Tacoma, Wash., low at $224,458.

175 tons, highway structures, Keene-Roxbury, N. H.; Peter Salvucci & Sons Inc., Waltham, Mass., low on general contract.

165 tons, Washington state slab bridge, Whatcom county, Washington; general contract to Lockyear & White, Longview, Wash.

120 tons, Washington state girder span, Chelan county; general contract to Everett McKellar, Chelan, low at $162,409.

85 tons, plus miscellaneous steel, bridge near Oakridge, Oreg.; bids to U.S. Engineer, Portland, Oreg., June 6.

PIPE . . .

CAST IRON PIPE PLACED

500 tons, 20 and 16 in., local improvement, Seattle, to the U.S. Pipe & Foundry Co., Seattle.

CAST IRON PIPE PENDING

400 tons, 14, 10 and 6 in.; bids to Amelie Dockendorf, city clerk, Marysville, Wash.

250 tons, 20 and 16 in.; bids in to Bremerton, Wash.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Argentine State Railways, one hundred thirty 1800-hp road switchers to Alco Products Inc., New York.

North Western of Pakistan, eighteen 1800-hp diesel units, to Alco Products Inc., New York.

Indian Railways, one hundred 1800-hp diesel units to Alco Products Inc., New York.

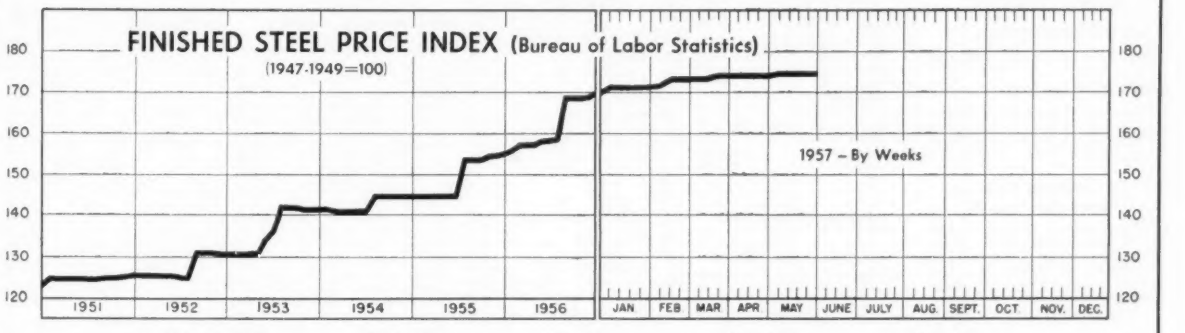
RAILROAD CARS PLACED

Delaware & Hudson, 1000 seventy-ton hopper cars to Bethlehem Steel Co., Bethlehem, Pa., to be delivered on the basis of 200 a year for the next five years.

Union Tank Car Co., thirteen 10,000-gal and ten 8000-gal tank cars, to its own shops.

Western Pacific, 100 refrigerator cars to Pacific Car & Foundry Co., Renton, Wash., and 75 seventy-ton drop-bottom gondolas, to ACF Industries Inc., New York.

Price Indexes and Composites



May 28, 1957	Week Ago	Month Ago	May Avg.	Year Ago
174.4	174.4	174.5	174.4	158.2

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended May 28

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$5.350	Bars, Reinforcing	5.788
Rails, Light, 40 lb	6.817	Bars, C.F., Carbon	9.910
Tie Plates	6.275	Bars, C.F., Alloy	13.425
Axles, Railway	9.400	Bars, C.F., Stainless, 302 (lb)	0.533
Wheels, Freight Car, 33 in. (per wheel)	57.50	Sheets, H.R., Carbon	5.945
Plates, Carbon	5.900	Sheets, C.R., Carbon	6.789
Structural Shapes	5.667	Sheets, Galvanized	8.070
Bars, Tool Steel, Carbon (lb)	0.480	Sheets, C.R., Stainless, 302 (lb)	0.660
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.585	Sheets, Electrical	11.225
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.274	Strip, C.R., Carbon	8.843
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.769	Strip, C.R., Stainless, 430 (lb)	0.475
Bars, H.R., Alloy	10.150	Strip, H.R., Carbon	6.000
Bars, H.R., Stainless, 303 (lb)	0.508	Pipe, Black, Buttweld (100 ft)	18.894
Bars, H.R., Carbon	6.075	Pipe, Galv., Buttweld (100 ft)	22.688
		Pipe, Line (100 ft)	190.108
		Casing, Oil Well, Carbon (100 ft)	185.566
		Casing, Oil Well, Alloy (100 ft)	288.980
		Tubes, Boiler (100 ft)	46.737
		Tubing, Mechanical, Carbon (100 ft)	23.713
		Tubing, Mechanical, Stainless, 304 (100 ft)	197.663
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	9.775
		Wire, Drawn, Stainless, 430 (lb)	0.636
		Bale Ties (bundle)	7.423
		Nails, Wire, 8d Common	9.365
		Wire, Barbed (80-rod spool)	8.347
		Woven Wire Fence (20-rod roll)	20.587

STEEL's FINISHED STEEL PRICE INDEX*

	May 29 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	228.59	228.59	227.41	210.45	171.92
Index in cents per lb	6.193	6.193	6.161	5.701	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT	$140.24	$140.24	$140.24	$128.98	$106.32
No. 2 Fdry Pig Iron, GT	64.70	64.70	64.70	60.27	52.54
Basic Pig Iron, GT	64.23	64.23	64.23	59.80	52.16
Malleable Pig Iron, GT	65.77	65.77	65.77	61.27	53.27
Steelmaking Scrap, GT	47.00	46.67	43.67	47.17	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	May 29 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.075	5.075	5.075	4.65	3.70
Bars, H.R., Chicago	5.075	5.075	5.075	4.65	3.70
Bars, H.R., deld., Philadelphia	5.365	5.365	5.365	4.93	4.252
Bars, C.F., Pittsburgh	6.85*	6.85*	6.85*	6.25*	4.55
Shapes, Std., Pittsburgh	5.00	5.00	5.00	4.60	3.65
Shapes, Std., Chicago	5.00	5.00	5.00	4.60	3.65
Shapes, deld., Philadelphia	5.31	5.31	5.31	5.00	3.93
Plates, Pittsburgh	4.85	4.85	4.85	4.50	3.70
Plates, Chicago	4.85	4.85	4.85	4.50	3.70
Plates, Coatesville, Pa.	5.25	5.25	5.25	4.80	4.15
Plates, Sparrows Point, Md.	4.85	4.85	4.85	4.50	3.70
Plates, Claymont, Del.	5.70	5.70	5.70	5.35	4.15
Sheets, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.60-3.75
Sheets, H.R., Chicago	4.675	4.675	4.675	4.325	3.60
Sheets, C.R., Pittsburgh	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Chicago	5.75	5.75	5.75	5.325	4.35
Sheets, C.R., Detroit	5.75-5.85	5.75-5.85	5.75-5.85	5.325-5.425	4.55
Sheets, Galv., Pittsburgh	6.30	6.30	6.30	5.85	4.80
Strip, H.R., Pittsburgh	4.675	4.675	4.675	4.325	3.75-4.00
Strip, H.R., Chicago	4.675	4.675	4.675	4.325	3.50
Strip, C.R., Pittsburgh	6.85	6.85	6.85	6.25	4.65-5.35
Strip, C.R., Chicago	6.85	6.85	6.85	6.25-6.35	4.90
Strip, C.R., Detroit	6.95	6.95	6.95	6.35	4.85-5.60
Wire, Basic, Pittsburgh	7.20	7.20	7.20	6.60	4.85-5.10
Nails, Wire, Pittsburgh	8.49	8.49	8.49	7.60	5.90-6.20
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.85	$8.70

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$91.50	$91.50	$91.50	$84.50	$66.00
Wire rods, 5/32-5/8" Pitts.	5.80	5.80	5.80	5.375	4.10-4.30

PIG IRON, Gross Ton	May 29 1957	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$65.50	$65.50	$65.50	$61.00	$53.00
Basic, Valley	64.50	64.50	64.50	60.00	52.00
Basic, deld., Phila.	68.38	68.38	68.38	63.76	56.75
No. 2 Fdry, NevilleIsland, Pa.	65.00	65.00	65.00	60.50	52.50
No. 2 Fdry, Chicago	65.00	65.00	65.00	60.50	52.50
No. 2 Fdry, deld., Phila.	68.88	68.88	68.88	64.26	57.25
No. 2 Fdry, Birm.	59.00	59.00	59.00	55.00	48.88
No. 2 Fdry (Birm.) deld. Cin.	66.70	66.70	66.70	62.70	55.49
Malleable, Valley	65.00	65.00	65.00	60.50	52.50
Malleable, Chicago	65.00	65.00	65.00	60.50	52.50
Ferromanganese, Duquesne	255.00†	255.00†	255.00†	215.00†	188.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$46.50	$45.50	$43.50	$48.50	$44.00
No. 1 Heavy Melt, E. Pa.	52.00	52.00	48.00	48.00	42.50
No. 1 Heavy Melt, Chicago	42.50	42.50	39.50	48.00	42.50
No. 1 Heavy Melt, Valley	48.50	43.50	41.50	49.50	44.00
No. 1 Heavy Melt, Cleve.	45.50	38.50	38.50	47.50	43.00
No. 1 Heavy Melt, Buffalo	40.50	40.50	41.50	48.50	43.00
Rails, Rerolling, Chicago	61.50	61.50	56.50	71.50	52.50
No. 1 Cast, Chicago	42.50	42.50	39.50	45.50	49.00

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$14.125	$14.75
Beehive, Fdry., Connlsvl.	18.00	18.00	18.00	16.50	17.50

Steel Prices

Mill prices as reported to STEEL, May 29, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 145; to footnotes, page 147.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$70.50

INGOTS, Alloy (NT)

Detroit S41 .....$74.00
Houston S5 .....74.00
Midland,Pa. C18 .....74.00
Munhall,Pa. U5 .....74.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)

Bessemer,Pa. U5 ....$74.00
Bridgeport,Conn. N19 ..79.00
Buffalo R2 .....74.00
Clairton,Pa. U5 .....74.00
Ensley,Ala. T2 .....74.00
Fairfield,Ala. T2 .....74.00
Fontana,Calif. K1 ....83.50
Gary,Ind. U5 .....74.00
Johnstown,Pa. B2 ....74.00
Lackawanna,N.Y. B2 ..74.00
LoneStar,Tex. L6 ....80.00
Munhall,Pa. U5 .....74.00
S.Chicago,Ill. R2, U5 .74.00
S.Duquesne,Pa. U5 ...74.00
Sterling,Ill. N15 .....74.00
Youngstown R2 .....74.00

Carbon, Forging (NT)

Bessemer,Pa. U5 ....$91.50
Bridgeport,Conn. N19 ..96.50
Buffalo R2 .....91.50
Canton,O. R2 .....94.00
Clairton,Pa. U5 .....91.50
Conshohocken,Pa. A3 ..96.50
Ensley,Ala. T2 .....91.50
Fairfield,Ala. T2 .....91.50
Fontana,Calif. K1 ....101.00
Gary,Ind. U5 .....91.50
Geneva,Utah C11 ....91.50
Houston S5 .....96.50
Johnstown,Pa. B2 ....91.50
Lackawanna,N.Y. B2..91.50
LosAngeles B3 .....101.00
Midland,Pa. C18 .....91.50
Munhall,Pa. U5 .....91.50
Seattle B3 .....105.00
S.Chicago R2, U5, W14 91.50
S.Duquesne,Pa. U5 ...91.50
S.SanFrancisco B3 ...101.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 ...$107.00
Bridgeport, Conn. N19.107.00
Buffalo R2 .....107.00
Canton,O. R2 .....107.00
Conshohocken,Pa. A3 .114.00
Detroit S41 .....107.00
Fontana,Calif. K1 ....128.00
Gary,Ind. U5 .....107.00
Houston S5 .....112.00
Ind.Harbor,Ind. Y1 ...107.00
Johnstown,Pa. B2 ....107.00
Lackawanna,N.Y. B2.107.00
LosAngeles B3 .....127.00
Massillon,O. R2 .....107.00
Midland,Pa. C18 .....107.00
Munhall,Pa. U5 .....107.00
S.Chicago R2,U5,W14 .107.00
S.Duquesne,Pa. U5 ..107.00
Struthers,O. Y1 .....107.00
Warren,O. C17 .....107.00

ROUNDS, SEAMLESS TUBE (NT)

Bridgeport,Conn. N19 $116.50
Buffalo R2 .....111.50
Canton,O. R2 .....114.00
Cleveland,O. R2 ....111.50
Gary,Ind. U5 .....111.50
S.Chicago,Ill. R2,W14.111.50
S.Duquesne,Pa. U5 ..111.50

SKELP

Aliquippa,Pa. J5 ....4.725
LoneStar,Tex. L6 .....5.025
Munhall,Pa. U5 .....4.625
Warren,O. R2 .....4.625
Youngstown R2, U5 ..4.625

WIRE RODS

AlabamaCity,Ala. R2 ..5.80
Aliquippa,Pa. J5 .....5.80
Alton,Ill. L1 .....6.00
Buffalo W12 .....5.80
Cleveland A7 .....5.80
Donora,Pa. A7 .....5.80
Fairfield,Ala. T2 .....5.80
Houston S5 .....6.05
IndianaHarbor,Ind. Y1 ..5.80
Johnstown,Pa. B2 .....5.80
Joliet,Ill. A7 .....5.80
KansasCity,Mo. S5 ....6.05
Kokomo,Ind. C16 .....5.90
LosAngeles B3 .....6.60
Minnequa,Colo. C10 ....6.05
Monessen,Pa. P17 .....5.80
N.Tonawanda,N.Y.B11 ..5.80
Pittsburg,Calif. C11 ....6.60
Portsmouth,O. P12 ....5.80
Roebling,N.J. R5 .....5.90
S.Chicago,Ill. R2 .....5.80
SparrowsPoint,Md. B2 ..5.90
Sterling,Ill.(1) N15 ...5.80
Sterling,Ill. N15 .....5.90
Struthers,O. Y1 .....5.80
Worcester,Mass. A7 ....6.10

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 .....5.00
Atlanta A11 .....5.20
Aliquippa,Pa. J5 .....5.00
Bessemer,Ala. T2 .....5.00
Bethlehem,Pa. B2 .....5.05
Birmingham C15 .....5.00
Clairton,Pa. U5 .....5.00
Fairfield,Ala. T2 .....5.00
Fontana,Calif. K1 .....5.75
Gary,Ind. U5 .....5.00
Geneva,Utah C11 .....5.00
Houston S5 .....5.10
Ind.Harbor,Ind. I-2 ....5.00
Johnstown,Pa. B2 .....5.05
Joliet,Ill. P22 .....5.00
KansasCity,Mo. S5 ....5.10
Lackawanna,N.Y. B2 ..5.05
LosAngeles B3 .....5.70
Minnequa,Colo. C10 ....5.30
Munhall,Pa. U5 .....5.00
Niles,Calif. P1 .....5.65
Phoenixville,Pa. P4 ....5.85
Portland,Oreg. O4 .....5.75
Seattle B3 .....5.75
S.Chicago,Ill. U5, W14..5.00
S.SanFrancisco B3 ....5.65
Sterling,Ill. N15 .....5.00
Torrance,Calif. C11 ....5.70
Weirton,W.Va. W6 ....5.00

Wide Flange

Bethlehem,Pa. B2 .....5.05
Clairton,Pa. U5 .....5.00
Fontana,Calif. K1 .....5.90
IndianaHarbor,Ind. I-2 .5.25
Lackawanna,N.Y. B2 ..5.05
Munhall,Pa. U5 .....5.00
Phoenixville,Pa. P4 ....5.85
S.Chicago,Ill. U5 .....5.00

Alloy Std. Shapes

Aliquippa,Pa. J5 .....6.20
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston S5 .....6.30
Munhall,Pa. U5 .....6.20
S.Chicago,Ill. U5 .....6.20

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 .....7.35
Bessemer,Ala. T2 .....7.35
Bethlehem,Pa. B2 .....7.40
Clairton,Pa. U5 .....7.35
Fairfield,Ala. T2 .....7.35
Fontana,Calif. K1 .....8.10
Gary,Ind. U5 .....7.35
Geneva,Utah C11 .....7.35
Houston S5 .....7.45
Ind.Harbor,Ind. I-2, Y1..7.35
Johnstown,Pa. B2 .....7.40
KansasCity,Mo. S5 ....7.45
Lackawanna,N.Y. B2 ..7.40
LosAngeles B3 .....8.05
Munhall,Pa. U5 .....7.35
Seattle B3 .....8.10
S.Chicago,Ill. U5, W14..7.35
S.SanFrancisco B3 ....8.00
Struthers,O. Y1 .....7.35

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....7.40
Lackawanna,N.Y. B2 ..7.40
Munhall,Pa. U5 .....7.35
S.Chicago,Ill. U5 .....7.35

PILING

BEARING PILES

Bethlehem,Pa. B2 .....5.05
Lackawanna, N.Y. B2 ..5.05
Munhall,Pa. U5 .....5.00
S.Chicago,Ill. U5 .....5.00

STEEL SHEET PILING

Lackawanna,N.Y. B2 ..5.90
Munhall,Pa. U5 .....5.90
S.Chicago,Ill. U5 .....5.90

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.85
Aliquippa,Pa. J5 .....4.85
Ashland,Ky.(15) A10 ..4.85
Bessemer,Ala. T2 .....4.85
Clairton,Pa. U5 .....4.85
Claymont,Del. C22 ....5.70
Cleveland J5, R2 .....4.95
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ..4.95
Detroit M1 .....4.95
Ecorse,Mich. G5 .....4.95
Fairfield,Ala. T2 .....4.85
Fontana,Calif.(30) K1 ..5.60
Gary,Ind. U5 .....4.85
Geneva,Utah C11 .....4.85
GraniteCity,Ill. G4 ....5.05
Harrisburg,Pa. P4 ....5.80
Houston S5 .....4.95
Ind.Harbor,Ind. I-2, Y1 4.85
Johnstown,Pa. B2 .....4.85
Lackawanna,N.Y. B2 ..4.85
LoneStar,Tex. L6 .....5.20
Minnequa,Colo. C10 ....5.70
Munhall,Pa. U5 .....4.85
Newport,Ky. A2 .....4.85
Pittsburgh J5 .....4.85
Riverdale,Ill. A1 .....4.85
Seattle B3 .....5.75
Sharon,Pa. S3 .....4.85
S.Chicago,Ill. U5, W14 4.85
SparrowsPoint,Md. B2 ..4.85
Sterling,Ill. N19 .....4.85
Steubenville,O. W10 ....4.85
Warren,O. R2 .....4.85
Youngstown R2, U5, Y1.4.85

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 ....6.20
Fontana,Calif. K1 .....7.00
Geneva,Utah C11 .....6.25
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron

Economy,Pa. B14 ....11.95

PLATES, H.S., L.A.

Aliquippa,Pa. J5 .....7.25
Bessemer,Ala. T2 .....7.25
Clairton,Pa. U5 .....7.25
Claymont,Del. C22 ....7.55
Cleveland J5, R2 .....7.25
Coatesville,Pa. L7 .....7.55
Conshohocken,Pa. A3 ..7.25
Ecorse,Mich. G5 .....7.35
Fairfield,Ala. T2 .....7.25
Fontana,Calif.(30) K1 ..8.00
Gary,Ind. U5 .....7.25
Geneva,Utah C11 .....7.25
Houston S5 .....7.35
Ind.Harbor,Ind. I-2, Y1..7.25
Johnstown,Pa. B2 .....7.25
Munhall,Pa. U5 .....7.25
Pittsburgh J5 .....7.25
Seattle B3 .....8.15
Sharon,Pa. S3 .....7.25
S.Chicago,Ill. U5, W14..7.25
SparrowsPoint,Md. B2 ..7.25
Warren,O. R2 .....7.25
Youngstown U5, Y1 ....7.25

PLATES, Alloy

Aliquippa,Pa. J5 .....6.85
Claymont,Del. C22 ....6.85
Coatesville,Pa. L7 .....6.85
Fontana,Calif.(30) K1 ..7.60
Gary,Ind. U5 .....6.85
Houston S5 .....6.95
Ind.Harbor,Ind. Y1 ....6.85
Johnstown,Pa. B2 .....6.85
Munhall,Pa. U5 .....6.85
Newport,Ky. A2 .....6.85
Pittsburgh J5 .....6.85
Seattle B3 .....7.75
Sharon,Pa. S3 .....6.85
S.Chicago,Ill. U5, W14..6.85
SparrowsPoint,Md. B2 ..6.85
Youngstown Y1 .....6.85

FLOOR PLATES

Cleveland J5 .....5.925
Conshohocken,Pa. A3 ..5.925
Harrisburg,Pa. P4 ....6.275
Ind.Harbor,Ind. I-2 ..5.925
Munhall,Pa. U5 .....5.925
S.Chicago,Ill. U5 ....5.925

PLATES, Ingot Iron

Ashland c.l. (15) A10..5.10
Ashland l.c.l. (15) A10..5.60
Cleveland c.l. R2 .....5.60
Warren,O. c.l. R2 .....5.60

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2 ..5.075
Aliquippa,Pa.(9) J5 ....5.075
Alton,Ill. L1 .....5.275
Atlanta(9) A11 .....5.275
Bessemer,Ala.(9) T2 ..5.075
Birmingham(9) C15 ..5.075
Bridgeport,Conn. N19 ..5.30
Buffalo(9) R2 .....5.075
Clairton,Pa.(9) U5 ....5.075
Cleveland(9) R2 .....5.075
Ecorse,Mich.(9) G5 ....5.175
Emeryville,Calif. J7 ..5.825
Fairfield,Ala.(9) T2 ..5.075
Fairless,Pa.(9) U5 ....5.225
Fontana,Calif.(9) K1 ..5.775
Gary,Ind.(9) U5 .....5.075
Houston(9) S5 .....5.325
Ind.Harbor(9) I-2, Y1..5.075
Johnstown,Pa.(9) B2 ..5.075
Joliet,Ill. P22 .....5.075
KansasCity,Mo.(9) S5..5.325
Lackawanna(9) B2 .....5.075
LosAngeles(9) B3 .....5.775
Milton,Pa. M18 .....5.225
Minnequa,Colo. C10 ....5.525
Niles,Calif. P1 .....5.775
N.T'wanda,N.Y.(9)B11 5.425
Pittsburg,Calif.(9) C11..5.775
Pittsburgh(9) J5 .....5.075
Portland,Oreg. O4 .....5.825
Seattle B3, N14 .....5.825
S Ch'e'go(9)R2,U5,W14 5.075
S.Duquesne,Pa.(9) U5..5.075
S SanFran.,Calif.(9)B3 5.825
Sterling,Ill.(1) N15 ....5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Tonawanda,N.Y. B12 ..5.45
Torrance,Calif.(9) C11 5.775
Youngstown(9) R2, U5 5.075

BARS, H.R. Leaded Alloy (Including leaded extra)

Warren,O. C17 .....7.125

BARS, Hot-Rolled Alloy

Aliquippa,Pa. J5 ....6.125
Bethlehem,Pa. B2 .....6.125
Bridgeport,Conn. N19 ..6.20
Buffalo R2 .....6.125
Canton,O. R2 .....6.125
Clairton,Pa. U5 .....6.125
Detroit S41 .....6.125
Ecorse,Mich. G5 .....6.225
Fairless,Pa. U5 .....6.275
Fontana,Calif. K1 ....7.175
Gary,Ind. U5 .....6.125
Houston S5 .....6.375
Ind.Harbor,Ind. I-2, Y1..6.125
Johnstown,Pa. B2 .....6.125
KansasCity,Mo. S5 ....6.375
Lackawanna,N.Y. B2 ..6.125
LosAngeles B3 .....7.175
Massillon,O. R2 .....6.125
Midland,Pa. C18 .....6.125
Pittsburgh J5 .....6.125
S.Chicago R2,U5,W14 ..6.125
S.Duquesne,Pa. U5 ....6.125
Struthers,O. Y1 .....6.125
Warren,O. C17 .....6.125
Youngstown U5 .....6.125

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 .....7.425
Bessemer,Ala. T2 .....7.425
Bethlehem,Pa. B2 .....7.425
Bridgeport,Conn. N19 ..7.50
Clairton,Pa. U5 .....7.425
Cleveland R2 .....7.425
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.425
Fontana,Calif. K1 ....8.125
Gary,Ind. U5 .....7.425
Houston S5 .....7.675
Ind.Harbor,Ind. Y1 ....7.425
Johnstown,Pa. B2 .....7.425
KansasCity,Mo. S5 ....7.675
Lackawanna,N.Y. B2..7.425
LosAngeles B3 .....8.125
Pittsburgh J5 .....7.425
Seattle B3 .....8.175
S.Chicago,Ill. U5, W14..7.425
S.Duquesne,Pa. U5 ....7.425
S.SanFrancisco B3 ....8.175
Struthers,O. Y1 .....7.425
Youngstown U5 .....7.425

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa.(9) B2 ...5.225
Houston(9) S5 .....5.325
KansasCity,Mo.(9) S5..5.325
Lackawanna(9) B2 .....5.075
Sterling,Ill. N15 .....5.175
Sterling,Ill.(1) N15 ....5.075
Tonawanda,N.Y. B12 ...5.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....5.075
Atlanta A11 .....5.575
Joliet,Ill. P22 .....5.075
Niles,Calif. P1 .....5.85
Pittsburgh J5 .....5.075
Portland,Oreg. O4 .....5.85
SanFrancisco S7 .....5.95

BAR SHAPES, Hot-Rolled Alloy

Aliquippa,Pa. J5 .....6.20
Clairton,Pa. U5 .....6.20
Gary,Ind. U5 .....6.20
Houston S5 .....6.45
KansasCity,Mo. S5 .....6.45
Pittsburgh J5 .....6.20
Youngstown U5 .....6.20

BARS, C.F., Leaded Alloy (Including leaded extra)

Ambridge,Pa. W18 ....9.475
BeaverFalls,Pa. M12 ..9.475
Chicago W18 .....9.475
Cleveland C20 .....9.475
LosAngeles S30 .....11.10
LosAngeles P2 .....11.35
Monaca,Pa. S17 .....9.475
Newark,N.J. W18 .....9.65
Warren,O. C17 .....9.475

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....6.85
BeaverFalls,Pa. M12,R2..6.85
Birmingham C15 .....7.45
Bridgeport,Conn. N19 ..7.20
Buffalo B5 .....6.90
Camden,N.J. P13 .....7.30
Carnegie,Pa. C12 .....6.85
Chicago W18 .....6.85
Cleveland A7, C20 ....6.85
Detroit B5, P17 .....7.05
Detroit S41 .....6.85
Donora,Pa. W8 .....6.85
Elyria,O. W8 .....6.85
FranklinPark,Ill. N5 ...6.85
Gary,Ind. U5 .....6.85
GreenBay,Wis. F7 .....6.85
Hammond,Ind. L2, M13..6.85
Hartford,Conn. R2 ....7.35
Harvey,Ill. B5 .....6.85
LosAngeles(49) S30 ....8.30
LosAngeles R2 .....8.75
LosAngeles P2 .....8.30
Mansfield,Mass. B5 ....7.40
Massillon,O. R2, R8 ...6.85
Midland,Pa. C18 .....6.85
Monaca,Pa. S17 .....6.85
Newark,N.J. W18 .....7.30
NewCastle,Pa. (17) B4..6.85
Pittsburgh J5 .....6.85
Plymouth,Mich. P5 ....7.10
Putnam,Conn. W18 ....7.40
Readville,Mass. C14 ....7.40
S.Chicago,Ill. W14 ....6.85
SpringCity,Pa. K3 .....7.30
Struthers,O. Y1 .....6.85
Waukegan,Ill. A7 .....6.85
Youngstown F3, Y1 ....6.85

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md. C5 C19..6.10

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....8.325
BeaverFalls,Pa. M12,R2 8.325
Bethlehem,Pa. B2 .....8.325
Bridgeport,Conn. N19 ..8.475
Buffalo B5 .....8.325
Camden,N.J. P13 .....8.50
Canton,O. T7 .....8.325
Carnegie,Pa. C12 .....8.325
Chicago W18 .....8.325
Cleveland A7, C20 ....8.325
Detroit B5, P17 .....8.525
Detroit S41 .....8.325
Donora,Pa. A7 .....8.325
Elyria,O. W8 .....8.325
FranklinPark,Ill. N5 ..8.325
Gary,Ind. R2 .....8.325
GreenBay,Wis. F7 .....8.325
Hammond,Ind. L2,M13 8.325
Hartford,Conn. R2 ....8.625
Harvey,Ill. B5 .....8.325
Lackawanna,N.Y. B2 ..8.325
LosAngeles S30 .....10.10
LosAngeles P2 .....10.20
Mansfield,Mass. B5 ...8.625
Massillon,O. R2, R8 ...8.325
Midland,Pa. C18 .....8.325
Monaca,Pa. S17 .....8.325
Newark,N.J. W18 .....8.50
Plymouth,Mich. P5 ....8.525
S.Chicago W14 .....8.325
SpringCity,Pa. K3 ....8.50
Struthers,O. Y1 .....8.325
Warren,O. C17 .....8.325
Waukegan,Ill. A7 .....8.325
Worcester,Mass. A7 ...8.625
Youngstown F3, Y1 ...8.325

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.075
Atlanta A11 .....5.275
Birmingham C15 .....5.075
Bridgeport,Conn. N9 ...5.30
Buffalo R2 .....5.075
Cleveland R2 .....5.075
Ecorse,Mich. G5 .....5.425
Emeryville,Calif. J7 ...5.825

Fairfield,Ala. T2 .....5.075
Fairless,Pa. U5 .....5.225
Fontana,Calif. K1 ....5.775
Ft.Worth,Tex.(4) T4 ..5.525
Gary,Ind. U5 .....5.075
Houston S5 .....5.325
Ind.Harbor,Ind. I-2, Y1 5.075
Johnstown,Pa. B2 ....5.075
Joliet,Ill. P22 .....5.075
KansasCity,Mo. S5 ....5.325
Lackawanna,N.Y. B2..5.075
LosAngeles B3 .....5.775
Milton,Pa. M18 .....5.225
Minnequa,Colo. C10 ...5.525
Niles,Calif. P1 .....5.775
Pittsburg,Calif. C11 ...5.775
Pittsburgh J5 .....5.075
Portland,Oreg. O4 ....5.825
SandSprings,Okla. S5 ..5.575
Seattle B3, N14 .....8.825
S.Chicago,Ill. R2 .....5.075
S.Duquesne,Pa. U5 ....5.075
S.SanFrancisco B3 ....5.825
SparrowsPoint,Md. B2.5.075
Sterling,Ill.(1) N15 ..5.075
Sterling,Ill. N15 .....5.175
Struthers,O. Y1 .....5.075
Tonawanda,N.Y. B12 ..5.65
Torrance,Calif. C11 ...5.775
Youngstown R2, U5 ...5.075

BARS, Reinforcing
(Fabricated; to Consumers)

Boston B2 .....7.30
Chicago U8 .....6.81
Cleveland U8 .....6.79
Johnstown,Pa. ¾-1" B2 6.73
KansasCity,Mo. S5 .....7.00
Lackawanna,N.Y. B2 ..6.50
Marion,O. P11 .....6.70
NewYork U8 .....7.20
Pittsburgh J5, U8 .....6.75
Seattle B3, N14 .....7.20
SparrowsPt. ⅛-1" B2 ..6.73
Williamsport,Pa. S19 ..6.65

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.075
ChicagoHts.(4)(44) I-2 5.075
ChicagoHts.(4) C2 ....5.075
Ft.Worth,Tex.(26) T4..5.525
Franklin,Pa.(3) F5 ....5.10
Franklin,Pa.(4) F5 ....5.075
JerseyShore,Pa.(4) J8 ..5.10
Marion,O.(3) P11 .....5.10
Moline,Ill.(3) R2 .....5.225
Tonawanda(3) B12 ....5.15
Tonawanda(4) B12 ....5.65
Williamsport,Pa.(3) S19.5.15

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 13.15
Economy,Pa.(D.R.)B14 16.35
Economy(Staybolt)B14. 16.80
McK.Rks.(S.R.) L5 ...13.15
McK.Rks.(D.R.) L5 ...18.00
McK.Rks.(Staybolt) L5 19.15

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 .....4.675
Allenport,Pa. P7 .....4.675
Ashland,Ky.(8) A10 ...4.675
Cleveland J5, R2 .....4.675
Conshohocken,Pa. A3 ..4.725
Detroit(8) M1 .....4.775
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 .....4.675
Fairless,Pa. U5 .....4.725
Fontana,Calif. K1 ....5.525
Gary,Ind. U5 .....4.675
Geneva,Utah C11 .....4.775
GraniteCity,Ill.(8) G4..4.875
Ind.Harbor,Ind. I-2, Y1 4.675
Irvin,Pa. U5 .....4.675
Lackawanna,N.Y. B2..4.675
Munhall,Pa. U5 .....4.675
Newport,Ky.(8) A2 ....4.675
Niles,O. M21 .....4.675
Pittsburg,Calif. C11 ..5.375
Pittsburgh J5 .....4.675
Portsmouth,O. P12 ....4.675
Riverdale,Ill. A1 .....4.675
Sharon,Pa. S3 .....4.675
S.Chicago,Ill. W14 ....4.675
SparrowsPoint,Md. B2..4.675
Steubenville,O. W10 ...4.675
Warren,O. R2 .....4.675
Weirton,W.Va. W6 ....4.675
Youngstown U5, Y1 ...4.675

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21 .....5.75

SHEETS, H.R. Alloy

Gary,Ind. U5 .....7.75
Ind.Harbor,Ind. Y1 ....7.75
Irvin,Pa. U5 .....7.75
Newport,Ky. A2 .....7.75
Youngstown U5, Y1 ....7.75

SHEETS, H.R. (14 Ga. & Heavier)
High-Strength, Low-Alloy

Cleveland J5, R2.....6.90
Conshohocken,Pa. A3 ..6.95
Ecorse,Mich. G5 .....7.00
Fairfield,Ala. T2 .....6.90
Fairless,Pa. U5 .....6.95
Fontana,Calif. K1 ....7.75
Gary,Ind. U5 .....6.90
Ind.Harbor,Ind. I-2, Y1.6.90
Irvin,Pa. U5 .....6.90
Lackawanna(35) B2 ...6.90
Munhall,Pa. U5 .....6.90
Pittsburgh J5 .....6.90
S.Chicago,Ill. U5 .....6.90
SparrowsPoint(36) B2..6.90
Warren,O. R2 .....6.90
Weirton,W.Va. W6 ....6.90
Youngstown U5, Y1 ....6.90

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ..4.925
Cleveland R2 .....5.425
Warren,O. R2 .....5.425

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 .....5.75
Cleveland J5, R2 .....5.75
Conshohocken,Pa. A3 ...5.80
Detroit M1 .....5.75
Ecorse,Mich. G5 .....5.85
Fairfield,Ala. T2 .....5.75
Fairless,Pa. U5 .....5.80
Follansbee,W.Va. F4 ..5.75
Fontana,Calif. K1 .....7.00
Gary,Ind. U5 .....5.75
GraniteCity,Ill. G4 .....5.95
Ind.Harbor,Ind. I-2, Y1.5.75
Irvin,Pa. U5 .....5.75
Lackawanna,N.Y. B2 ..5.75
Mansfield,O. E6 .....5.75
Middletown,O. A10 ....5.75
Newport,Ky. A2 .....5.75
Pittsburg,Calif. C11 ....6.70
Pittsburgh J5 .....5.75
Portsmouth,O. P12 .....5.75
SparrowsPoint,Md. B2 ..5.75
Steubenville,O. W10 ....5.75
Warren,O. R2 .....5.75
Weirton,W.Va. W6 ....5.75
Yorkville,O. W10 .....5.75
Youngstown Y1 .....5.75

SHEETS, Cold-Rolled
High-Strength, Low-Alloy

Cleveland J5, R2 .....8.525
Ecorse,Mich. G5 .....8.625
Fairless,Pa. U5 .....8.575
Fontana,Calif. K1 ....9.775
Gary,Ind. U5 .....8.525
IndianaHarbor,Ind. Y1.8.525
Irvin,Pa. U5 .....8.525
Lackawanna(37) B2 ..8.525
Pittsburgh J5 .....8.525
SparrowsPoint(38) B2.8.525
Warren,O. R2 .....8.525
Weirton,W.Va. W6 ....8.525
Youngstown Y1 .....8.525

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.50
Middletown,O. A10 ....6.25
Warren,O. R2 .....6.50

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.65	6.90
Canton,O. R2	....6.65	7.15
Fairfield T2	.....6.65	6.90
Gary,Ind. U5	.....6.65	6.90
GraniteCity,Ill. G4	6.85	...
Ind.Harbor I-2	...6.65	6.90
Irvin,Pa. U5	....6.65	6.90
Kokomo,Ind. C16	..6.75	...
MartinsFry. W10	..6.65	6.90
Pittsburgh J5	....6.65	...
Pitts.,Calif. C11	...7.40	...
SparrowsPt. B2	..6.65	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....6.90

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 .....6.30‡
Ashland,Ky. A10 .....6.30†
Canton,O. R2 .....6.30‡
Dover,O. R1 .....6.30†
Fairfield,Ala. T2 .....6.30†
Gary,Ind. U5 .....6.30†
GraniteCity,Ill. G4 ....6.50*
Ind.Harbor,Ind. I-2 ...6.30†
Irvin,Pa. U5 .....6.30†
Kokomo,Ind. C16 .....6.40‡
MartinsFerry,O. W10 ..6.30*
Middletown,O. A10 ...6.30†
Pittsburg,Calif. C11 ...7.05*
Pittsburgh J5 .....6.30†
SparrowsPt.,Md. B2 ...6.30†
Warren,O. R2 .....6.30†
Weirton,W.Va. W6 ....6.30*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 .....7.025

SHEETS, Galvanized
High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.275
SparrowsPoint(39) B2..9.275

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.70
Irvin,Pa. U5 .....6.70

SHEETS, Galvanized Ingot Iron
(Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.55
Middletown,O. A10 .....6.55

SHEETS, Electrogalvanized

Cleveland(28) R2 .....7.125
Niles,O.(28) R2 .....7.125
Weirton,W.Va. W6 ....6.975

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).8.95
Butler,Pa. A10 (type 2).9.05

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.325
Cleveland R2 .....6.325
Gary,Ind. U5 .....6.325
GraniteCity,Ill. G4 ....6.525
Ind.Harbor,Ind. I-2, Y1 6.325
Irvin,Pa. U5 .....6.325
Middletown,O. A10 ....6.325
Niles,O. M21 .....6.325
Youngstown Y1 .....6.325

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.35
Ind.Harbor,Ind. I-2 ...8.175
Yorkville,O. W10 .....8.175

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 6.70
Gary,Ind. U5 .....6.70
Mansfield,O. E6 .....6.70
Middletown,O. A10 ....6.70
Niles,O. M21 .....6.70
Weirton,W.Va. W6 .....6.70

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.10

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U.S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Dearborn Division, Sharon Steel Corp.
D4 Disston Division, H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Josiyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National Standard Co.
N2 National Supply Co.
N3 National Tube Div., U.S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mill
N15 Northwestern S.&W. Co.
N19 Northeastern Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts.Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.

T2 Tenn.Coal & Iron Div., U.S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U5 U.S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U.S. Steel Supply Div., U.S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.675
Allenport,Pa. P7	4.675
Alton,Ill. L1	4.875
Ashland,Ky.(8) A10	4.675
Atlanta A11	4.875
Bessemer,Ala. T2	4.675
Birmingham C15	4.675
Buffalo(27) R2	4.675
Conshohocken,Pa. A3	4.725
Detroit M1	4.775
Ecorse,Mich. G5	4.775
Fairfield,Ala. T2	4.675
Fontana,Calif. K1	5.525
Gary,Ind. U5	4.675
Houston S5	4.925
Ind.Harbor,Ind. I-2, Y1	4.675
Johnstown,Pa.(25) B2	4.675
KansasCity,Mo. S5	4.925
Lackaw'na,N.Y.(25) B2	4.675
LosAngeles(25) B3	5.425
Minnequa,Colo. C10	5.775
Pittsburg,Calif. C11	5.425
Riverdale,Ill. A1	4.675
SanFrancisco S7	5.95
Seattle(25) B3	5.675
Seattle N14	5.675
Sharon,Pa. S3	4.675
S.Chicago,Ill. W14	4.675
S.SanFrancisco(25) B3	5.425
SparrowsPoint,Md. B2	4.675
Sterling,Ill.(1) N15	4.675
Sterling,Ill. N15	4.775
Torrance,Calif. C11	5.425
Warren,O. R2	4.675
Weirton,W.Va. W6	4.675
Youngstown U5	4.675

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	7.75
Gary,Ind. U5	7.75
Ind.Harbor,Ind. Y1	7.75
LosAngeles B3	8.95
Newport,Ky. A2	7.75
Sharon,Pa. S3	7.75
S.Chicago,Ill. W14	7.75
Youngstown U5, Y1	7.75

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	6.95
Conshohocken,Pa. A3	6.95
Ecorse,Mich. G5	7.05
Fairfield,Ala. T2	6.95
Gary,Ind. U5	6.95
Houston S5	7.20
Ind.Harbor,Ind. I-2, Y1	6.95
KansasCity,Mo. S5	7.20
Lackawanna,N.Y. B2	6.95
LosAngeles(25) B3	7.70
Seattle(25) B3	7.95
Sharon,Pa. S3	6.95
S.SanFrancisco(25) B3	7.70
SparrowsPoint,Md. B2	6.95
Warren,O. R2	6.95
Weirton,W.Va. W6	6.95
Youngstown U5, Y1	6.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.925
Warren,O. R2	5.425

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	6.85
Baltimore T6	6.85
Boston T6	7.40
Buffalo S40	6.85
Cleveland A7, J5	6.85
Conshohocken,Pa. A3	6.90
Dearborn,Mich. D3	6.95
Detroit D2, M1, F20	6.95
Dover,O. G6	6.85
Ecorse,Mich. G5	6.95
Evanston,Ill. M22	6.95
Follansbee,W.Va. F4	6.85
Fontana,Calif. K1	8.70
FranklinPark,Ill. T6	6.95
Ind.Harbor,Ind. Y1	6.85
Indianapolis C8	7.00
LosAngeles C1	8.90
NewBedford,Mass. R10	7.30
NewBritain(10) S15	6.85
NewCastle,Pa. B4, E5	6.85
NewHaven,Conn. D2	7.30
NewKensington,Pa. A6	6.85
Pawtucket,R.I. R3	7.50
Pawtucket,R.I. N8	7.40
Pittsburgh J5	6.85
Riverdale,Ill. A1	6.95
Rome,N.Y.(32) R6	6.85
Sharon,Pa. S3	6.85
Trenton,N.J.(31) R5	8.30
Wallingford,Conn. W2	7.30
Warren,O. R2, T5	6.85
Weirton,W.Va. W6	6.85
Worcester,Mass. A7	7.40
Youngstown C8, Y1	6.85

STRIP, Cold-Rolled Alloy

Boston T6	14.90
Carnegie,Pa. S18	14.55
Cleveland A7	14.55
Dover,O. G6	14.55
FranklinPark,Ill. T6	14.55
Harrison,N.J. C18	14.55
Indianapolis C8	14.70
Pawtucket,R.I. N8	14.90
Sharon,Pa. S3	14.55
Worcester,Mass. A7	14.85
Youngstown C8	14.55

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.00
Dearborn,Mich. D3	10.10
Dover,O. G6	10.10
Ecorse,Mich. G5	10.10
Ind.Harbor,Ind. Y1	10.20
Sharon,Pa. S3	10.00
Warren,O. R2	10.00
Weirton,W.Va. W6	10.00
Youngstown Y1	10.20

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.20	10.40	12.60	15.60	18.55
Boston T6	9.20	10.40	12.60	15.60	18.55
Bristol,Conn. W1	....	10.40	12.60	15.60	18.55
Carnegie,Pa. S18	8.65	10.10	12.30	15.30	....
Cleveland A7	8.65	10.10	12.30	15.30	18.25
Cleveland C7	....	10.10	12.30	15.30	18.25
Dearborn,Mich. D3	8.75	10.20	12.40	....	....
Detroit D2	8.75	10.20	12.40	15.40	....
Dover,O. G6	8.65	10.10	12.30	15.30	18.25
Evanston,Ill. M22	8.65	10.10	12.30	....	....
FranklinPark,Ill. T6	8.75	10.10	12.30	15.30	18.25
Harrison,N.J. C18	....	....	12.60	15.60	18.55
Indianapolis C8	8.80	10.25	12.30	15.30	18.25
LosAngeles C1	10.85	12.30	14.50	....	....
NewBritain,Conn.(10) S15	8.65	10.10	12.30	15.30	18.25
NewCastle,Pa. B4, E5	8.65	10.10	12.30	15.30	....
NewHaven,Conn. D2	9.10	10.40	12.60	15.60	....
NewKensington,Pa. A6	8.65	10.10	12.30	15.30	....
New York W3	....	10.40	12.60	15.60	18.55
Pawtucket,R.I. N8	9.20	10.40	12.60	15.60	18.55
Riverdale,Ill. A1	8.75	10.10	12.30	15.30	18.25
Rome,N.Y.(32) R6	8.65	10.10	12.30	15.30	18.25
Sharon,Pa. S3	8.65	10.10	12.30	15.30	18.25
Trenton,N.J. R5	....	10.40	12.60	15.60	18.55
Wallingford,Conn. W2	9.10	10.40	12.60	15.60	18.45
Warren,O. T5	8.65	10.10	12.30	15.30	18.25
Worcester,Mass. A7, T6	9.20	10.40	12.60	15.60	18.55
Youngstown C8	8.65	10.10	12.30	15.30	18.25

Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	17.10	20.95	25.30
Buffalo W12	17.10	....	....
FranklinPark,Ill. T6	17.45	21.30	25.65
Harrison,N.J. C18	17.10	20.95	25.30
New York W3	17.10	20.95	25.30
Palmer,Mass. W12	17.10	....	....
Trenton,N.J. R5	17.10	20.95	25.30
Worcester,Mass. A7, T6	17.10	20.95	25.30
Youngstown C8	17.45	21.30	25.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.60

STRIP, C.R. Electrogalvanized

Cleveland A7	6.85*
Dover,O. G6	6.85*
Evanston,Ill. M22	6.95
Riverdale,Ill. A1	6.95*
Warren,O. B9, T5	6.85*
Worcester,Mass. A7	7.40*
Youngstown C8	6.85*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	6.975

TIGHT COOPERAGE HOOP

Atlanta A11	5.40
Riverdale,Ill. A1	5.25
Sharon,Pa. S3	5.10
Youngstown U5	5.10

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	....	11.00	12.05	13.05
Brackenridge,Pa. A4	...	....	11.00	12.05	13.05
Mansfield,O. E6	9.20	10.35	11.00	12.05	13.05
Newport,Ky. A2	9.20	10.35	11.00	12.05	13.05
Niles,O. M21	9.20	10.35	11.00	12.05	....
Vandergrift,Pa. U5	....	10.35	11.00	12.05	13.05
Warren,O. R2	9.20	10.35	11.00	12.05	....
Zanesville,O. A10	...	10.35	11.00	12.05	13.05
Zanesville,O. A10 (FP coils)	...	10.85	11.525	12.575	13.55
Zanesville,O. A10 (SP coils)	...	....	11.025	12.075	13.05

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	...	...	....	11.525	12.575 13.55
GraniteCity,Ill. G4	9.40*	10.55*	11.225*	12.275*	....
IndianaHarbor,Ind. I-2	9.20†	10.35*	11.025*	12.075*	....
Mansfield,O. E6	9.70	10.85	11.525	12.575	13.55
Vandergrift,Pa. U5	9.20*	10.35*	11.025*	12.075*	13.05*
Vandergrift,Pa. U5	....	10.85†	11.525†	12.575†	13.55†
Warren,O. R2	9.20*	10.85	11.525	12.575	13.55

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	14.05	14.60	15.10	16.15
Brackenridge,Pa. A4	14.05	....	....	....
Vandergrift,Pa. U5	14.05	14.60	15.10	16.15
Zanesville,O. A10	14.05	14.60	15.10	16.15

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	16.90	18.50	19.00	19.50	....
Butler,Pa. A10	....	....	18.50	19.00	19.50	....
Vandergrift,Pa. U5	15.90	16.90	18.50	19.00	19.50	14.55**
Warren,O. R2	....	....	....	....	....	14.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.425	7.625	....
Niles,O. R2	7.425	7.625	7.925

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.05	$10.30
Fairfield,Ala.T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif.K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va.W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING

Black Plate (29 Gage)	
Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES

(Special Coated; Base Box)	
Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES

(8 lb Coated; Base Box)	
Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.20
Aliquippa,Pa. J5	7.20
Alton,Ill. L1	7.40
Atlanta A11	7.40
Bartonville,Ill. K4	7.30
Buffalo W12	7.20
Chicago W13	7.20
Cleveland A7, C20	7.20
Crawfordsville,Ind. M8	7.30
Donora,Pa. A7	7.20
Duluth A7	7.20
Fairfield,Ala. T2	7.20
Fostoria,O.(24) S1	7.30
Houston S5	7.45
Jacksonville,Fla. M8	7.55
Johnstown,Pa. B2	7.20
Joliet,Ill. A7	7.20
KansasCity,Mo. S5	7.45
Kokomo,Ind. C16	7.30
LosAngeles B3	8.15
Minnequa,Colo. C10	7.45
Monessen,Pa. P7, P16	7.20
N.Tonawanda,N.Y. B11	7.20
Palmer,Mass. W12	7.50
Pittsburg,Calif. C11	8.15
Portsmouth,O. P12	7.20
Rankin,Pa. A7	7.20
S.Chicago,Ill. R2	7.20
S.SanFrancisco C10	8.15
SparrowsPoint,Md. B2	7.30
Sterling,Ill.(1) N15	7.20
Sterling,Ill. N15	7.30
Struthers,O. Y1	7.20
Waukegan,Ill. A7	7.20
Worcester,Mass. A7	7.50

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	11.90
Buffalo W12	11.90
Cleveland A7	11.90
Donora,Pa. A7	11.90
Duluth A7	11.90
Johnstown,Pa. B2	11.90
Minnequa,Colo. C10	12.025
Monessen,Pa. P16	11.90
Muncie,Ind. I-7	12.10
NewHaven,Conn. A7	12.20
Palmer,Mass. W12	12.20
Pittsburg,Calif. C11	12.70
Portsmouth,O. P12	11.90
Roebling,N.J. R5	12.20
SparrowsPt.,Md. B2	12.00
Struthers,O. Y1	11.90
Trenton,N.J. A7	12.20
Waukegan,Ill. A7	11.90
Worcester,Mass. A7	12.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5	8.70
Alton,Ill. L1	8.90
Buffalo W12	8.70
Cleveland A7	8.70
Donora,Pa. A7	8.70
Duluth A7	8.70
Johnstown,Pa. B2	8.70
KansasCity,Mo. S5	8.95
Minnequa,Colo. C10	8.90
LosAngeles B3	9.65
Monessen,Pa. P7, P16	8.70
NewHaven,Conn. A7	9.00
Palmer,Mass. W12	9.00
Pittsburg,Calif. C11	9.65
Portsmouth,O. P12	8.70
Roebling,N.J. R5	8.70
S.Chicago,Ill. R2	8.70
S.SanFrancisco C10	9.65
SparrowsPt.,Md. B2	8.80
Struthers,O. Y1	8.70
Trenton,N.J. A7	9.00
Waukegan,Ill. A7	8.70
Worcester,Mass. A7	9.00

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	9.025
Alton,Ill. L1	9.225
Bartonville,Ill. K4	9.125
Buffalo W12	9.025
Cleveland A7	9.025
Donora,Pa. A7	9.025
Duluth A7	9.025
Fostoria,O. S1	9.075
Johnstown,Pa. B2	9.025
LosAngeles B3	9.975
Milbury,Mass.(12) N6	9.325
Minnequa,Colo. C10	9.275
Monessen,Pa. P7, P16	9.025
Muncie,Ind. I-7	9.225
Palmer,Mass. W12	9.325
Pittsburg,Calif. C11	9.975
Portsmouth,O. P12	9.025
Roebling,N.J. R5	9.025
S.Chicago,Ill. R2	9.025
S.SanFrancisco C10	9.975
SparrowsPt.,Md. B2	9.125
Struthers,O. Y1	9.025
Trenton,N.J. A7	9.325
Waukegan,Ill. A7	9.025
Worcester J4, T6, W12	9.325
Worcester,Mass. A7	9.325

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	14.65
Bartonville,Ill. K4	14.25
Buffalo W12	14.45
Chicago W13	14.45
Cleveland A7	14.45
Crawfordsville,Ind. M8	14.25
Fostoria,O. S1	14.45
Jacksonville,Fla. M8	14.50
Johnstown,Pa. B2	14.45
Kokomo,Ind. C16	14.45
Monessen,Pa. P7	14.45
Muncie,Ind. I-7	14.65
Palmer,Mass. W12	14.75
Roebling,N.J. C10	14.45
S.SanFrancisco C10	14.80
Waukegan,Ill. A7	14.45
Worcester,Mass. A7, T6	14.75

ROPE WIRE

Bartonville,Ill. K4	12.00
Buffalo W12	12.00
Fostoria,O. S1	12.00
Johnstown,Pa. B2	12.00
Monessen,Pa. P7	12.00
Muncie,Ind. I-7	12.20
Palmer,Mass. W12	12.30
Portsmouth,O. P12	12.00
Roebling,N.J. R5	12.30
SparrowsPt.,Md., B2	12.10
Struthers,O. Y1	12.00
Worcester,Mass. J4	12.30

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE

WIRE, Tire Bead

Bartonville,Ill. K4 .....15.75
Monessen,Pa. P16 ....15.45
Roebling,N.J. R5 ....16.10

WIRE, Cold-Rolled Flat

Anderson,Ind. G6 ....10.75
Baltimore T6 .....11.05
Boston T6 .....11.05
Buffalo W12 .....10.75
Chicago W13 .....10.85
Cleveland A7 .....10.75
Crawfordsville,Ind. M8.10.75
Dover,O. G6 .....10.75
Fostoria,O. S1 .....11.05
Franklin Park,Ill. T6 ..10.85
Kokomo,Ind. C16 .....10.75
Massillon,O. R8 .....10.75
Milwaukee C23 .....10.95
Monessen,Pa. P7, P16.10.75
New Kensington,Pa. A6 10.75
Palmer,Mass. W12 ....11.05
Pawtucket,R.I. N8 ....11.05
Riverdale,Ill. A1 .....10.85
Rome,N.Y. R6 .....10.75
Trenton,N.J. R5 .....11.05
Worcester,Mass. A7, T6 11.05

NAILS & POLISHED STAPLES,

Stock	Col.
Alabama City,Ala. R2	.164
Aliquippa,Pa. J5	.164
Atlanta A11	.164
Bartonville,Ill. K4	.166
Crawfordsville,Ind. M8	.166
Donora,Pa. A7	.164
Duluth A7	.164
Fairfield,Ala. T2	.164
Houston,Tex. S5	.169
Jacksonville,Fla.(20) M8	175
Johnstown,Pa. B2	.164
Joliet,Ill. A7	.164
Kansas City,Mo. S5	.169
Kokomo,Ind. C16	.166
Minnequa,Colo. C10	.169
Monessen,Pa. P7	.164
Pittsburg,Calif. C11	.183
Rankin,Pa. A7	.164
S.Chicago,Ill. R2	.164
Sparrows Pt.,Md. B2	.166
Sterling,Ill. (7) N15	.166
Worcester,Mass. A7	.170

NAILS, Stock

	Col.
Chicago W13	.164
Cleveland A9	.170

(To Wholesalers; per cwt)

Galveston,Tex. D7 ....$8.75

NAILS, Cut (100 lb keg)
To Dealers (33)

Conshohocken,Pa. A3 ..$9.80
Wheeling,W.Va. W10 ..9.80

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150

Alabama City,Ala. R2 ..$9.82
Atlanta A11 .....9.63
Bartonville,Ill. K4 ....9.63
Buffalo W12 .....9.82
Chicago W13 .....9.82
Crawfordsville,Ind. M8 .9.63
Donora,Pa. A7 .....9.82
Duluth A7 .....9.82
Fairfield,Ala. T2 .....9.82
Houston S5 .....10.07
Jacksonville,Fla. M8 ...10.09
Johnstown,Pa. B2 .....9.82
Joliet,Ill. A7 .....9.82
Kansas City,Mo. S5 ....10.07
Kokomo,Ind. C16 .....9.92
Los Angeles B3 .....10.61
Minnequa,Colo. C10 ..10.07
Pittsburg,Calif. C11 ..10.60
S.Chicago,Ill. R2 .....9.82
S.San Francisco C10 ..10.60
Sparrows Pt.,Md. B2 ....9.92
Sterling,Ill.(37) N15 ..9.82

Coil No. 6500 Stand.

Alabama City,Ala. R2. .$10.15
Atlanta A11 .....9.95
Bartonville,Ill. K4 ....9.95
Buffalo W12 .....10.15
Chicago W13 .....10.15
Crawfordsville,Ind. M8 9.95
Donora,Pa. A7 .....10.15
Duluth A7 .....10.15
Fairfield,Ala. T2 ....10.15
Houston S5 .....10.40
Jacksonville,Fla. M8 ..10.41
Johnstown,Pa. B2 ....10.15
Joliet,Ill. A7 .....10.15
Kansas City,Mo. S5 ....10.40
Kokomo,Ind. C16 ....10.25
Los Angeles B3 .....10.95
Minnequa,Colo. C10 ...10.40
Pittsburg,Calif. C11 ..10.95
S.Chicago,Ill. R2 ....10.15
S.San Francisco C10 ....10.95
Sparrows Pt.,Md. B2 ..10.25
Sterling,Ill.(37) N15 ..10.15

Coil Interim

Alabama City,Ala. R2. .$10.20
Atlanta A11 .....10.00
Bartonville,Ill. K4 ...10.00
Buffalo W12 .....10.20
Chicago W13 .....10.20
Crawfordsville,Ind. M8.10.00
Donora,Pa. A7 .....10.20
Duluth A7 .....10.20
Fairfield,Ala. T2 .....10.20
Houston S5 .....10.45
Jacksonville,Fla. M8 ..10.46
Johnstown,Pa. B2 ....10.20
Joliet,Ill. A7 .....10.20
Kansas City,Mo. S5 ....10.45
Kokomo,Ind. C16 .....10.30
Los Angeles B3 .....11.00
Minnequa,Colo. C10 ..10.45
Pittsburg,Calif. C11 ...11.00
S.Chicago,Ill. R2 .....10.20
S.San Francisco C10 ...11.00
Sparrows Pt.,Md. B2 ..10.30
Sterling,Ill. (37) N15..10.20

BALE TIES, Single Loop

	Col.
Alabama City,Ala. R2	.196
Atlanta A11	.192
Bartonville,Ill. K4	.192
Crawfordsville,Ind. M8	.192
Donora,Pa. A7	.196
Duluth A7	.196
Fairfield,Ala. T2	.196
Houston S5	.201
Jacksonville,Fla. M8	.197
Joliet,Ill. A7	.190
Kansas City,Mo. S5	.201
Kokomo,Ind. C16	.198
Minnequa,Colo. C10	.201
Pittsburg,Calif. C11	.220
S.San Francisco C10	.220
Sterling,Ill. (7) N15	.196
Sparrows Pt.,Md. B2	.198
Tonawanda,N.Y. B12	.196
Williamsport,Pa. S19	.175

FENCE POSTS

Chicago Hts.,Ill. C2, I-2 .167
Duluth A7 167
Franklin,Pa. F5 167
Huntington,W.Va. W7 ..169
Johnstown,Pa. B2 167
Marion,O. P11 167
Minnequa,Colo. C10 172
Sterling,Ill.(1) N15 167
Tonawanda,N.Y. B12 ..169
Williamsport,Pa. S19 ...175

WIRE, Barbed

	Col.
Alabama City,Ala. R2.	.184••
Aliquippa,Pa. J5	.181§
Atlanta A11	.190•
Bartonville,Ill. K4	.190
Crawfordsville,Ind. M8	.190
Donora,Pa. A7	.184†
Duluth A7	.184†
Fairfield,Ala. T2	.184†
Houston,Tex. S5	.189••
Jacksonville,Fla. M8	.195
Johnstown,Pa. B2	.188•
Joliet,Ill. A7	.184†
Kansas City,Mo. S5	.189••
Kokomo,Ind. C16	.186†
Minnequa,Colo. C10	.189••
Monessen,Pa. P7	.188•
Pittsburg,Calif. C11	.204†
Rankin,Pa. A7	.184†
S.Chicago,Ill. R2	.184••
S.San Francisco C10	.204••
Sparrows Point,Md. B2	.190•
Sterling,Ill.(7) N15	.190•

WOVEN FENCE, 9-15 Ga. Col.

Ala.City,Ala. R2 .....176••
Aliq'ppa,Pa. 9-14½ga.J5 179§
Atlanta A11 .....182•
Bartonville,Ill. K4 182
Crawfordsville,Ind. M8 ..182
Donora,Pa. A7 .....176†
Duluth A7 .....176†
Fairfield,Ala. T2 .....176†
Houston,Tex. S5 ....181••
Jacksonville,Fla. M8 ...187
Johnstown,Pa.(43) B2 ..180•
Joliet,Ill. A7 .....176†
Kansas City,Mo. S5 ...181••
Kokomo,Ind. C16 .....178†
Minnequa,Colo. C10 ..181••
Monessen,Pa. 9 ga. P7..180•
Pittsburg,Calif. C11 ....199†
Rankin,Pa. A7 .....176†
S.Chicago,Ill. R2 .....176••
Sterling,Ill.(7) N15 ...182•

WIRE (16 gage)	An'ld Galv. Stone	Galv. Stone
Ala.City,Ala.R2	16.00	17.55••
Aliq'ppa,Pa. J5	..15.70	17.50
Bartonville K4	..15.80	17.75
Cleveland A7	..16.00	....
Crawf'dsville M8	15.80	17.75
Fostoria,O. S1	..16.50	18.05†
Houston S5	....16.25	17.80••
Jacksonville M8.	..16.05	18.00
Johnstown B2	..16.00	17.95•
Kan.City,Mo. S5	16.25	....
Kokomo C16	..16.10	17.65†
Minnequa C10	..16.25	17.80•
P'lm'r,Mass.W12	16.30	17.85†
Pitts.,Calif. C11.	16.35	17.90†
Sparrows Pt. B2	16.10	18.05•
Sterling(37) N15	16.00	17.95•
Waukegan A7	..16.00	17.55†
Worcester A7	...16.30	....

WIRE, Merchant Quality (6 to 8 gage)

	An'ld Galv.
Ala.City,Ala. R2	8.20 8.75••
Aliquippa J5	....7.95 8.475§
Atlanta (48) A11	8.05 8.65•
Bartonville(48) K4	8.05 8.65
Buffalo W12	....8.20 8.75†
Cleveland A7	....8.20 ....
Crawfordsville M8	.8.05 8.65
Donora,Pa. A7	..8.20 8.75†
Duluth A7	.....8.20 8.75†
Fairfield T2	.....8.20 8.75†
Houston(48) S5	..8.45 9.00••
Jacks'ville,Fla. M8	8.30 8.90
Johnstown B2(48)	8.20 8.95•
Joliet,Ill. A7	....8.20 8.75†
Kans.City(48) S5	8.45 9.00••
Kokomo C16	....8.30 8.85†
Los Angeles B3	..9.15 9.90•
Minnequa C10	....8.45 9.00‡
Monessen P7(48)	.7.95 8.55•
Palmer,Mass. W12	8.50 9.05†
Pitts.,Calif. C11	..9.15 9.70†
Rankin,Pa. A7	..8.20 8.75†
S.Chicago R2	...8.20 8.75••
S.San Fran. C10	..9.15 9.70•
Spar'wsPt. B2(48)	8.30 9.05•
Sterling(37)(48)N15	8.35 9.10
Struth'rs,O.(48)Y1	8.20 8.85‡
Worcester,Mass.A7	8.50 9.05†

Based on zinc price of: •13.50c. †5c. §10c. ‡Less than 10c. ††13c. ••Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:
6 in. and shorter.... 52.5
Longer than 6 in. .. 43.5
⅝ in. thru 1 in:
6 in. and shorter.. 43.5
Longer than 6 in. .. 41.5
1⅛ in. and larger:
All lengths 41.5
Undersized Body (rolled thread)
½ in. and smaller:
6 in. and shorter.. 52.5
Carriage, Machine, Lag Bolts
Hot Galvanized:
½ in. and smaller:
6 in. and shorter.. 32.0
Longer than 6 in. .. 19.0
⅝ in. thru 1 in.:
6 in. and shorter .. 16.0
Longer than 6 in. .. 16.0
1⅛ in. and larger:
All lengths 16.0
Lag Bolts
All diameters:
6 in. and shorter .. 52.5
Longer than 6 in. .. 44.5
Plow and Tap Bolts
½ in. and smaller by 6 in. and shorter .. 52.0
Larger than ½ in. or longer than 6 in. .. 44.5
Blank Bolts 44.5
Step, Elevator, Tire Bolts 52.0
Stove Bolts, Slotted
⅛ to ¼-in. incl., 3 in. and shorter.. 54.00
$\frac{5}{16}$ to ½-in., inclusive 54.00

NUTS

Reg. & Heavy Square Nuts:
All sizes 58.0
Square Nuts, Reg. & Heavy, Hot Galvanized:
All sizes 44.0
Hex Nuts, Reg. & Heavy, Hot Pressed:

¾ in. and smaller..	61.5
⅞ in. to 1 in., incl.	57.5
1⅛ in. to 1½ in., incl.	62.5
1⅝ in. and larger..	56.0

Hex Nuts, Reg. & Heavy, Cold Punched:

¾ in. and smaller..	61.5
⅞ in. to 1½ in., incl.	57.5
1⅝ in. and larger..	56.0

Hex Nuts, All Types, Hot Galvanized:

¾ in. and smaller..	48.0
⅞ in. to 1 in., incl.	44.0
1⅛ in. to 1½ in., incl.	49.0

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller..	61.5
⅞ in. to 1½ in., incl.	57.5
1⅝ in. and larger..	56.0

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller ..	64.00
1⅛ in. to 1½ in., incl.	60.5
1⅝ in. and larger..	56.0

Semifinished Hex Nuts, Reg. (Including Slotted):

⅝ in. and smaller..	61.5
¾ in. to 1-in., incl. .	64.0
1⅛ in. to 1½ in., incl.	60.5
1⅝ in. and larger ..	56.0

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller..	44.0
¾, ⅞ and 1 in. diam.	27.0

Longer than 6 in.:

⅝ in. and smaller..	14.0
¾, ⅞ and 1 in. diam.	0.5

High Carbon, Heat Treated:
6 in. and shorter:

⅝ in. and smaller..	31.0
¾, ⅞ and 1 in. diam.	9.0

Longer than 6 in.:

⅝ in. and smaller..	+6
¾, ⅞ and 1 in. diam.	+24

Flat Head Capscrews:
¾ in. and smaller. +65.0
Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam.:
6 in. and shorter .. 11
Longer than 6 in. ..+10

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½-in., larger 11.50
$\frac{7}{16}$-in. under List less 23%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	24.55	23.54
1¼	13	....	29.07	23.36
1½	13	27.45	32.14	25.83
1¾	13	32.43	37.97	30.51
2	13	36.34	42.56	34.20
2¼	13	40.93	47.94	38.52
2¼	12	44.42	52.03	41.81
2½	12	48.94	57.31	46.05
2¾	12	52.99	62.05	49.88
3	12	56.51	66.18	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	5.275	5.175	5.225	6.25
Ensley,Ala. T2	5.275	5.175	....	6.25
Fairfield,Ala. T2	....	....	....	6.25
Huntington,W.Va. C15	....	....	....	6.25
Gary,Ind. U5	5.275	5.175	5.225	...
Indiana Harbor,Ind. I-2	5.275	5.175	5.225	...
Johnstown,Pa. B2	....	....	....(16)	6.25
Lackawanna,N.Y. B2	5.275	5.175	....	6.25
Minnequa,Colo. C10	5.275	5.175	....	6.75
Steelton,Pa. B2	5.275	5.175	....	...
Williamsport,Pa. S19	....	....	....	6.15

TIE PLATES

Fairfield,Ala. T2 .....6.275
Gary,Ind. U5 .....6.275
Ind.Harbor,Ind. I-2 ....6.275
Lackawanna,N.Y. B2 ..6.275
Minnequa,Colo. C10 ..6.275
Seattle B3 .....6.425
Steelton,Pa. B2 .....6.275
Torrance,Calif. C11 ...6.425

JOINT BARS

Bessemer,Pa. U5 .....6.60
Fairfield,Ala. T2 .....6.60
Ind.Harbor,Ind. I-2 ....6.60
Joliet,Ill. U5 .....6.60
Lackawanna,N.Y. B2 ..6.60
Minnequa,Colo. C10 ....6.60
Steelton,Pa. B2 .....6.60

AXLES

Ind.Harbor,Ind. S13 ....8.35
Johnstown,Pa. B2 .....8.35

TRACK BOLTS, Untreated

Cleveland R2 .....13.85
Kansas City,Mo. S5 ....13.85
Lebanon,Pa. B2 .....13.85
Minnequa,Colo. C10 ....13.85
Pittsburgh P14 .....13.10
Seattle B3 .....14.35

SCREW SPIKES

Lebanon,Pa. B2 .....13.60
Pittsburgh P14 .....12.85

STANDARD TRACK SPIKES

Fairfield,Ala. T2 ....9.225
Ind.Harbor,Ind. I-2, Y1 9.225
Kansas City,Mo. S5 ....9.225
Lebanon,Pa. B2 .....9.225
Minnequa,Colo. C10 ...9.225
Pittsburgh J5 .....9.225
Seattle B3 .....9.725
S.Chicago,Ill. R2 .....9.225
Struthers,O. Y1 .....9.225
Youngstown R2 .....9.225

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in.; 6.23c; 1 15/16 to 8 in.; inclusive, 6.60c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.685c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝-in.; 7.30c, for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½-in. and smaller rounds; 8.65c, over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+5.25	+21.75	1.25	+16.5	3.75	+14	5.25	+12.5	5.25	+12.5	5	+12.75	7.5	+10.25
Ambridge, Pa. N2	+5.25	....	1.25	....	3.75	....	5.25	....	5.25	....	5	....	7.5	....
Lorain, O. N3	+5.25	+21.75	1.25	+16.5	3.75	+14	5.25	+12.5	5.25	+12.5	5	+12.75	7.5	+10.25
Youngstown Y1	+5.25	+21.75	1.25	+16.5	3.75	+14	5.25	+12.5	5.25	+12.5	5	+12.75	7.5	+10.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+5.25	+21.75	1.25	+16.5	3.75	+14	5.25	+12.5	5.25	+12.5	5	+12.75	7.5	+10.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	9.25	+8	12.25	+4	15.75	0.5	18.25	1.75
Alton, Ill. L1	....	....	....	....	....	....	7.25	+10	10.25	+6	13.75	+1.5	16.25	+0.25
Benwood, W. Va. W10	6.5	+22	+4.75	+30.25	+14.75	+39.25	9.25	+8	12.25	+4	15.75	0.5	18.25	1.75
Butler, Pa. F6	7.5	+21	+3	+28.5	+12.5	+37	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	9.25	+8	12.25	+4	15.75	0.5	18.25	1.75
Fairless, Pa. N3	....	....	....	....	....	....	7.25	+10	10.25	+6	13.75	+1.5	16.25	+0.25
Fontana, Calif. K1	....	....	....	....	....	....	3.75	+21	+0.75	+17	2.75	+12.5	5.25	+11.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	8.25	+9	11.25	+5	14.75	+0.5	17.25	+0.75
Lorain, O. N3	....	....	....	....	....	....	9.25	+8	12.25	+4	15.75	0.5	18.25	1.75
Sharon, Pa. S4	6.5	+22	+4	+29.5	+13.5	+38	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	9.25	+8	12.25	+4	15.75	0.5	18.25	1.75
Sparrows Pt., Md. B2	5.5	+23	+0.5	+30.5	+14.5	+39	7.25	+10	10.25	+6	13.75	+1.5	16.25	+0.25
Wheatland, Pa. W9	7.5	+21	+3	+28.5	+12.5	+37	9.25	+8	12.25	+4	15.75	0.5	18.25	1.75
Youngstown R2, Y1	....	....	....	....	....	....	9.25	+8	12.25	+4	15.75	0.5	18.25	1.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	18.75	2.75	19.25	3.25	20.75	3.5	20.75	3.5	....	....	....	....
Alton, Ill. L1	16.75	0.75	17.25	1.25	18.75	1.5	18.75	1.5	....	....	....	....
Benwood, W. Va. W10	18.75	2.75	19.25	3.25	20.75	3.5	20.75	3.5	10.25	+7.5	10.25	+7.5
Etna, Pa. N2	18.75	2.75	19.25	3.25	20.75	3.5	20.75	3.5	10.25	+7.5	10.25	+7.5
Fairless, Pa. N3	16.75	0.75	17.25	1.25	18.75	1.5	18.75	1.5	8.25	+9.5	8.25	+9.5
Fontana, Calif. K1	5.75	+10.25	6.25	+9.75	7.75	+9.5	7.75	+9.5	+2.75	+20.5	+2.75	+20.5
Indiana Harbor, Ind. Y1	17.75	1.75	18.25	2.25	19.75	2.5	19.25	2.5	9.25	+8.5	9.25	+8.5
Lorain, O. N3	18.75	2.75	19.25	3.25	20.75	3.5	20.75	3.5	....	....	....	....
Sharon, Pa. M6	18.75	2.75	19.25	3.25	20.75	3.5	20.75	3.5	....	....	....	....
Sparrows Pt., Md. B2	16.75	0.75	17.25	1.25	18.75	1.5	18.75	1.5	8.25	+9.5	8.25	+9.5
Wheatland, Pa. W9	18.75	2.75	19.25	3.25	20.75	3.5	20.75	3.5	10.25	+7.5	10.25	+7.5
Youngstown R2, Y1	18.75	2.75	19.25	3.25	20.75	3.5	20.75	3.5	10.25	+7.5	10.25	+7.5

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	21.25	26.00	....	34.50	....	40.50	42.50	46.75	43.25
202	22.75	29.00	35.00	37.50	39.25	41.25	43.25	47.25	47.25
301	22.25	27.00	35.75	35.75	40.25	42.50	44.50	49.25	45.75
302	24.25	30.25	38.50	39.00	41.00	43.25	45.50	50.00	50.00
302B	24.50	31.50	39.25	44.00	43.25	45.50	47.50	54.75	54.75
303	....	30.75	39.50	....	44.00	46.25	48.00	54.50	54.50
304	26.00	32.00	39.00	42.50	43.75	46.00	48.75	53.25	53.25
304L	....	....	46.50	49.50	51.25	53.50	56.25	60.75	60.75
305	27.50	35.25	40.75	45.75	43.75	46.00	49.25	56.50	56.50
308	29.50	36.75	45.50	48.25	50.75	53.50	58.00	60.50	60.50
309	38.25	47.50	55.50	62.00	61.25	64.50	68.25	77.50	77.50
310	47.75	59.25	75.00	81.00	83.25	87.50	89.25	93.00	93.00
314	....	....	....	....	83.25	....	80.25	....	100.50
316	38.25	47.50	59.75	66.50	66.75	70.25	73.75	78.25	78.25
316L	....	....	67.25	73.00	74.25	77.75	81.25	85.75	85.75
317	46.25	57.75	73.75	84.75	83.00	87.25	90.00	97.00	97.00
321	31.00	38.50	45.25	51.50	50.50	53.25	57.50	63.00	63.00
18-8 CbTa	35.50	44.75	53.50	61.00	59.25	62.25	67.00	76.25	76.25
403	....	....	30.75	....	34.50	36.25	38.75	46.50	46.50
405	18.75	24.50	28.50	34.50	32.50	34.00	36.00	45.00	45.00
410	16.00	20.75	27.25	29.75	31.00	32.50	33.75	38.75	38.75
416	....	....	27.75	....	31.50	33.00	34.75	46.50	46.50
420	....	32.25	33.00	40.25	37.75	39.75	43.50	59.50	59.50
430	16.25	21.00	27.75	30.75	31.50	33.00	34.50	39.25	39.25
430F	....	....	28.25	....	32.00	33.50	35.25	49.75	49.75
431	....	27.75	36.25	....	40.50	42.50	44.25	53.75	53.75
446	....	....	37.75	56.75	42.50	44.75	46.00	67.25	67.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Div., H. K. Porter Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U.S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; National-Standard Co.; National Tube Div., U.S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

Stainless	—Plates— 5%	Carbon Base 10%	15%	20%	Sheets Carbon Base 20%
302	....	....	....	....	35.50
304	33.15	36.20	40.30	44.50	37.75
304-L	35.40	38.80	43.15	47.65	....
316	38.35	41.60	45.90	50.15	55.50
316-L	43.55	47.60	52.70	57.85	....
316-Cb	43.85	48.10	53.40	58.75	....
321	34.90	37.95	42.10	46.40	44.75
347	37.05	41.25	46.45	51.70	54.25
405	27.55	29.20	33.15	37.05	....
410	27.00	28.70	32.65	36.55	....
430	27.00	28.70	32.65	36.55	....
Inconel	47.28	57.90	68.50	79.20	....
Nickel	40.00	50.30	60.65	71.05	....
Nickel, Low Carbon	40.30	50.95	61.65	72.50	....
Monel	41.70	51.90	62.15	72.40	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.00	39.85

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb
Regular Carbon	0.290
Extra Carbon	0.345
Special Carbon	0.41-0.45
Oil Hardening	0.450

Grade	$ per lb
Cr Hot Work	0.45-0.495
W-Cr Hot Work	0.43-0.475
V-Cr Hot Work	0.460
Hi-Carbon-Cr	0.830

Grade by Analysis (%)

W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	....	....	4.170
18.25	4.25	1	4.75	....	....	2.385
18	4	2	9	....	....	2.755
18	4	2	....	....	....	1.845
18	4	1	....	....	....	1.680
9	3.5	..	....	....	....	1.275
13.5	4	3	....	....	....	1.945
13.75	3.75	2	5	....	....	2.325
6.4	4.5	1.9	....	5	....	1.185
6	4	3	....	6	....	1.430
1.5	4	1	....	8.5	....	1.040

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malle-able	Besse-mer
AlabamaCity,Ala. R2	58.50	59.00	....	....
Birmingham R2	58.50	59.00‡	....	....
Birmingham U6	....	59.00‡	63.00	....
Woodward,Ala. W15	58.50**	59.00‡	63.00	....
Cincinnati, deld.	....	66.70	....	....
Buffalo District				
Buffalo H1, R2	64.50	65.00	65.50	66.00
Tonawanda,N.Y. W12	64.50	65.00	65.50	66.00
N.Tonawanda,N.Y. T9	....	65.00	65.50	66.00
Boston, deld.	75.79	76.29	76.79	....
Rochester,N.Y., deld.	67.52	68.02	68.52	....
Syracuse,N.Y., deld.	68.62	69.12	69.62	....
Chicago District				
Chicago I-3	64.50	65.00	65.00	65.50
S.Chicago,Ill. R2	64.50	....	65.00	....
S.Chicago,Ill. Y1	64.50	65.00	65.00	....
S.Chicago,Ill. W14	64.50	....	65.00	65.50
Milwaukee, deld.	66.96	67.46	67.46	67.96
Muskegon,Mich., deld.	....	78.83	78.83	....
Cleveland District				
Cleveland R2, A7	64.50	65.00	65.00	65.50
Akron,O., deld.	67.62	68.12	68.12	68.62
Mid-Atlantic District				
Birdsboro,Pa. B10	66.50	67.00	67.50	68.00
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	66.50	67.00	67.50	68.00
New York, deld.	....	73.20	73.70	....
Newark,N.J., deld.	70.52	71.02	71.52	72.02
Philadelphia, deld.	68.38	68.88	69.38	69.88
Troy,N.Y. R2	66.50	67.00	67.50	68.00
Pittsburgh District				
NevilleIsland, Pa. P6	64.50	65.00	65.00	65.50
Pittsburgh (N&S sides), Aliquippa, deld.	....	66.45	66.45	66.98
McKeesRocks,Pa., deld.	....	66.10	66.10	66.63
Lawrenceville, Homestead, Wilmerding,Monaca,Pa., deld.	....	66.76	66.76	67.29
Verona,Trafford,Pa., deld.	66.79	67.32	67.32	67.85
Brackenridge,Pa., deld.	67.10	67.60	67.60	68.13
Midland,Pa. C18	64.50	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malle-able	Besse-mer
Hubbard,O. Y1	....	....	65.00	....
Sharpsville,Pa. S6	64.50	....	65.00	65.50
Youngstown Y1	....	....	65.00	65.50
Mansfield,O., deld.	69.40	....	69.90	70.40
Duluth I-3	64.50	65.00	65.00	65.50
Erie,Pa. I-3	64.50	65.00	65.00	65.50
Everett,Mass. E1	66.00	66.50	67.00	....
Fontana,Calif. K1	72.50	73.00	....	....
Geneva,Utah C11	64.50	65.00	....	....
GraniteCity, Ill. G4	66.40	66.90	67.40	....
Ironton,Utah C11	64.50	65.00	....	....
Minnequa,Colo. C10	66.50	67.00	67.50	....
Rockwood,Tenn. T3	....	59.00‡	63.00	....
Toledo,O. I-3	64.50	65.00	65.00	65.50
Cincinnati, deld.	71.04	71.54	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.60%, $59.50.
‡Phos. 0.70-0.90%; Phos. 0.30-0.50%, $60.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,O. I-3, J1	77.25
Buffalo H1	78.50

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$105.50
NiagaraFalls,N.Y. P15	105.50
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max frgt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	78.50
Troy,N.Y. R2 (Phos. 0.035% max)	72.50
Philadelphia, deld.	80.26
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	69.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	69.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	69.50
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	69.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Houston, Seattle no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††		Carbon	Floor
Atlanta	8.17§	9.37§	9.83§	....	8.21	8.45	10.23	....	8.59	8.55	10.51
Baltimore	7.88	8.98	9.31	....	8.36	8.53	9.13[3]	14.68	8.75	8.26	9.76
Birmingham	7.80	9.00	9.52	....	7.82	8.07	10.12	....	8.20	8.16	10.31
Boston	8.84	9.88	9.24	60.42	8.89	9.07	....	14.69	9.10	9.18	10.68
Buffalo	7.85	9.00	10.68	....	8.05	8.25	8.70	14.50	8.50	8.50	10.05
Chattanooga	7.99	9.24	9.10	....	8.00	8.24	10.04	....	8.44	8.40	10.26
Chicago	7.78	9.00	9.65	53.25	7.82	8.07	8.35	14.15	8.20	8.16	9.49
Cincinnati	7.94	9.05	9.65	50.00	8.14	8.38	8.84	14.46	8.74	8.52	9.78
Cleveland	7.78	8.98	9.55	53.43	7.92	8.16	8.60	14.24	8.57	8.39	9.72
Denver	9.70	11.30	12.49	....	9.80	9.95	10.65	18.89	9.80	9.70	11.40
Detroit	8.03	9.25	10.00	59.50	8.17	8.37	8.70	14.41	8.74	8.51	9.74
Erie, Pa.	7.85	9.00	9.60[10]	....	7.95	8.20	8.70[10]	....	8.50	8.35	9.75
Houston	8.80	9.75	10.99	....	7.75	8.05	9.15	15.00	8.00	8.80	10.30
Jackson, Miss.	8.09	9.34	9.79	....	8.16	8.41	10.23	....	8.54	8.50	10.34
Los Angeles	9.10	12.30	11.25	57.45	9.15	9.20	12.10	15.50	9.15	9.65	11.80
Milwaukee	7.93	9.13	9.93	....	7.95	8.20	8.58	14.28	8.41	8.29	9.62
Moline, Ill.	8.13	9.35	10.05	....	8.17	8.42	8.70	....	8.55	8.51	...
New York	8.45	9.66	10.21	60.20	8.90	9.01	....	14.59	8.91	9.01	10.31
Norfolk, Va.	8.05	...	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.15	9.07	10.29	50.69	8.82	8.71	9.31	14.51	8.70	8.68	9.70
Pittsburgh	7.78	8.99	10.00	50.00	7.92	8.07	8.60	14.15	8.20	8.16	9.49
Portland, Oreg.	9.20	11.20	11.55	55.20	11.05‡‡	9.35	13.80	14.60	9.35	9.00	12.20
Richmond, Va.	8.00	...	10.14	....	8.55	8.40	10.00	....	8.95	8.40	9.90
St. Louis	8.14	9.34	10.16	73.36	8.19	8.43	8.96	14.51	8.67	8.52	9.86
St. Paul	8.39	9.59	10.26	....	8.43	8.68	9.21	....	8.94	8.90	10.10
San Francisco	9.05	10.95	10.90	53.45	9.05	9.15	12.40	15.60	9.15	9.30	11.55
Seattle	9.55	10.70	11.65	55.20	9.55	9.50	13.40	15.85	9.35	9.30	11.70
Spokane, Wash.	9.55	10.70	11.65	....	9.55	9.50	13.40	16.60	9.35	9.30	11.70
Washington	8.48	9.58	....	....	9.06	9.13	9.73	....	9.35	8.86	10.36

*Prices do not include gage extras; †prices include gage and coating extras (based on 12.50c zinc at Los Angeles and 11.50c at other points), except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; §42 in. and under; **½-in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle; 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [3]—400 to 999 lb; [5]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beach Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, O., $138; Cutler, Utah, $165.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, O., Hawstone, Pa., $150; Warren, Niles, Windham, O., Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $157; Morrisville, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $145; Woodbridge, N. J., $135; Philadelphia, $130.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, O., $100; Clearfield, Pa., Portsmouth, O., $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billimeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $16; Thornton, McCook, Ill., $16.35; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½-in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜-in. grains with fines: Baltimore, $72.40.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60% $33-$36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34-$35; Mexican, all-rail, duty paid, $27-$27.75; barge, Brownsville, Tex., $27.75-$29.

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish:	
Deld. east of Mississippi river, ocean bags 23,000 lb and over	10.50
F.o.b. Riverton or Camden, N.J., west of Mississippi river	9.50
Sponge Iron, domestic, 98 + % Fe:	
Deld. east of Mississippi river, 23,000 lb and over	10.50
F.o.b. Riverton, N.J., west of Mississippi river	9.50
Sponge Iron, Canadian:	
F.o.b. shipping point	9.50
Electrolytic Iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	26.00
Annealed, 99.5% Fe	36.50
Unannealed (99+ % Fe)	34.00
Unannealed (99+ % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade, 99.00-290.00, in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500 lb drum, frght allowed Carlots	38.20
Ton lots	40.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	34.80-43.20†
Bronze, 5000-lb lots	52.80-57.20†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.065
Nickel-Silver, 5000-lb lots	53.30-57.60†
Phosphor-Copper, 5000-lb lots	62.00
Copper (atomized) 5000-lb lots	44.50-52.00‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.08
Stainless Steel, 316	$1.44
Tin	14.50*
Zinc, 5000-lb lots	19.75-33.00‡
Tungsten: Melting grade, 99%	Dollars
60 to 2000 mesh:	
1000 lb and over	4.00
Less than 1000 lb	4.15
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni. **64% Cu, 18% Zn, 18% Ni.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Diam.	Length	Per 100 lb
2	24	$57.75
2½	30	37.25
3	40	35.25
4	40	33.25
5½	40	33.00
6	60	30.00
7	60	26.75
8, 9, 10	60	26.50
12	72	25.50
14	60	25.50
16	72	24.50
17	60	25.50
18	72	24.50
20	72	24.00
24	84	24.75

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross tons, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old range bessemer	11.85
Old range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	35.00-36.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$23.00-24.00
Domestic, concentrates, mine	55.00

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.60-1.70 per long ton unit, c.i.f. U.S. ports, duty for buyer's account; other than Indian, $1.45-1.50; contracts by negotiation.

Chrome Ore

Gross ton f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$55.00-58.00
48% 2.8:1	52.00-55.00
48% no ratio	46.00-48.00

South African Transvaal

48% no ratio	$40.00-41.00
44% no ratio	30.00-31.00

Turkish

48% 3:1	$59.00-62.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked $1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$3.10-3.60
60-65%	3.60-3.80

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.75-15.75
Connellsville, foundry	17.50-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	33.78
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, deld.	32.25
Saginaw, deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, O., ovens	29.00
Cincinnati, deld.	29.27
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Painesville, O., ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
Neville Island (Pittsburgh), Pa., ovens	29.25
St. Paul, ovens	29.75
Chicago, deld.	33.14
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.80 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.	

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$7.15	$7.15	$7.15	$7.40
Bar Size Angles	6.95	6.95	6.95	7.05
Structural Angles	7.10	7.10	7.10	7.30
I-Beams	7.50	7.50	7.50	7.75
Channels	7.55	7.55	7.55	7.80
Plates (basic bessemer)	9.00	9.00	9.00	9.30
Sheets, H.R.	8.55	8.55	8.55	8.85
Sheets, C.R. (drawing quality)	8.95	8.95	8.95	9.35
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	27.17	27.17	27.17	27.64
Barbed Wire (†)	6.80	6.80	6.80	7.25
Merchant Bars	6.95	6.95	6.95	7.30
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.38	6.38	6.38	6.78
Wire Rods, O-H Cold Heading Quality No. 5	6.72	6.72	6.72	7.12
Bright Common Wire Nails (‡)	8.40	8.40	8.40	8.57

†Per 82-lb, net, reel. ‡Per 100-lb kegs, 20d nails and heavier.

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can be

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FORMED • DRAWN

Fabricates easier than solid stainless—costs nearly 30% less.

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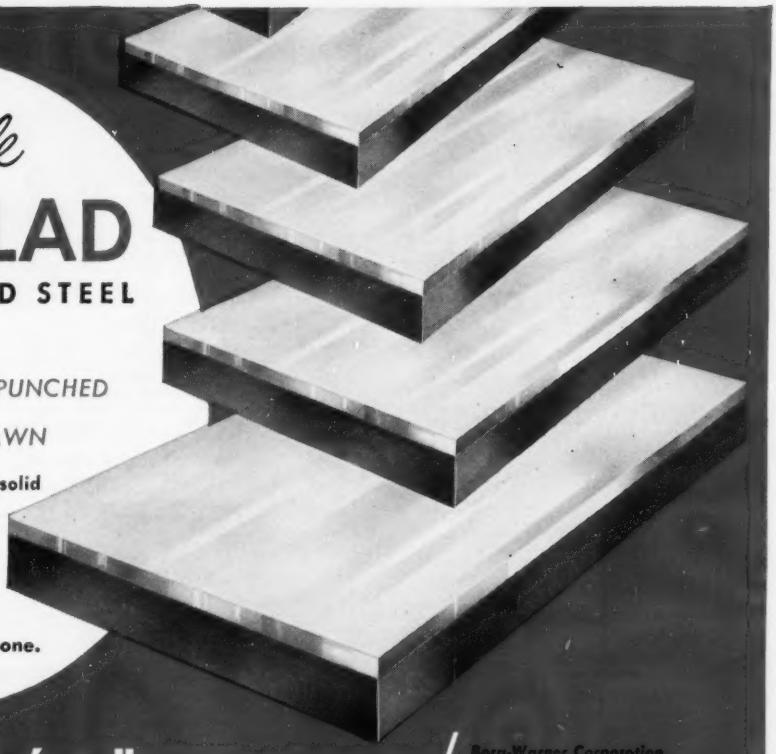
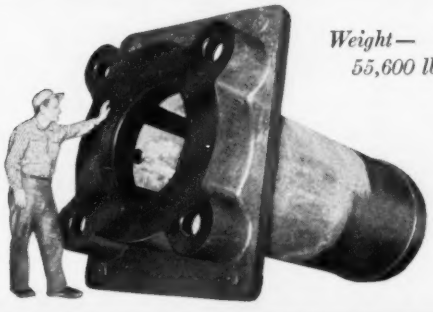


B-W BORG-WARNER

Ingersoll STEEL DIVISION

Borg-Warner Corporation
310 S. Michigan Ave., Chicago 4, Ill.
Plant: New Castle, Indiana



Weight—
55,600 lbs.

PRECISION

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CASTINGS

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MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton; $255, Johnstown, Duquesne, Sheridan, Pa., Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively.

(Mn 79-81%). Lump $263 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMINUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk, 27.75c per lb of contained Cr; c.l. packed 29.3c, ton lot 31.05c; less ton 32.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract carload, lump, bulk, C 0.025% max (Simplex) 34.75c per lb contained Cr, 0.02% max 41.5c, 0.03% max 41c, 0.06% max 39.5c, 0.1% max 39c, 0.15% max 38.75c, 0.2% max 38.5c, 0.5% max 38.25c, 1.0% max 37.5c, 1.5% max 37.35c, 2.0% max 37.25c. Ton lot, add 3.4c, less ton add 5.1c. Carload packed add 1.75c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 29.05c per lb contained Cr. Packed, c.l. 30.65c, ton 32.45c, less ton 33.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8M x D, 20.85c, per lb of alloy, ton lot 22.10c; less ton lots 23.3c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 41.35c per lb of contained Cr; 1" x down, bulk 42.35c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31 less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 13c per lb of contained Si. Packed c.l. 15.5c, ton lot 16.95c, less ton 18.6c, f.o.b. Alloy, W. Va., Ashtabula, Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot, 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy, ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C. (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5%-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c per lb. f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Contract, carload, bulk, 19c per lb of briquet, carload packed in box pallets 19.2c, in bags 20.1c; 3000 lb to c.l. in box pallets 20.4c; 2000 lb to c.l. in bags, 21.3c; less than 2000 lb in bags 22.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l. bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk, 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l. bags 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max. C 0.4% max). Contract, ton lot, 2" x D. $5.10 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $5.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 19c per lb of alloy, ton lot 20.15c, less ton 21.4c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5.7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; Freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

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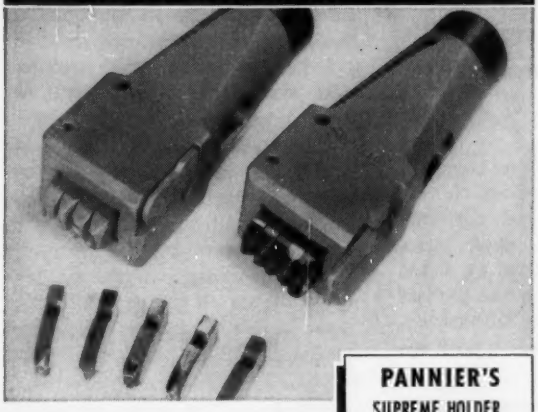

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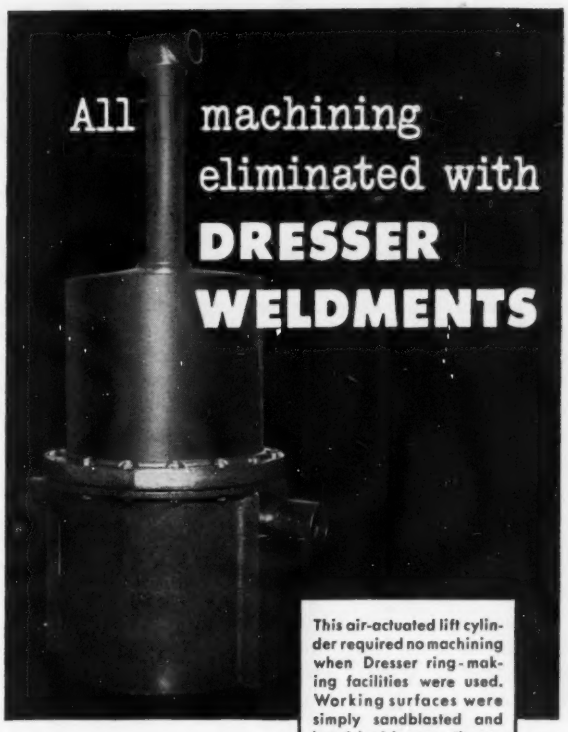

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Scrap Price Recovery Extended

Additional advance scored at some points, boosting STEEL's index on steelmaking grades to $47, highest since March. Brokers report supplies are limited

Scrap Prices, Page 156

Pittsburgh — Predictions of a lower steel operating rate in July are having little effect on broker bidding for scrap. Collection by dealers is improving slightly, but it's still slow. Dealers want higher prices. They are confident they will go above present levels when steel operations increase in September and October.

Brokers say the mills would have to pay at least $47 a ton for No. 1 heavy melting scrap if they entered the market today.

Philadelphia — Scrap prices are unchanged here, but the market undertone is strong with sellers busy covering on old orders. This applies not only to domestic but to foreign orders as well. Two ships are loading here, with further export tonnage scheduled.

New York — Brokers have advanced their buying prices on several grades of steel and cast iron scrap. Increases in most cases have amounted to about $1 a ton and reflect pressure on the part of brokers to get covered on back orders for domestic and export account.

Boston — No. 1 heavy melting steel scrap, No. 1 bundles and busheling have advanced for the third straight week on buying against orders for eastern Pennsylvania delivery. Brokers are paying up to $40.50, shipping point. Borings and turnings also are up $1-$1.50 a ton. Cast iron buying is slow.

Cleveland — Sharply increased prices were reportedly paid for industrial material at last month's end. The auto lists went at $5 and $6 a ton over closings the month before. Until the situation jells, it is difficult to tell just where the market stands. Best trade opinion: No. 1 grades would command $45-$46 if a representative purchase were made. Dealer stocks are not large.

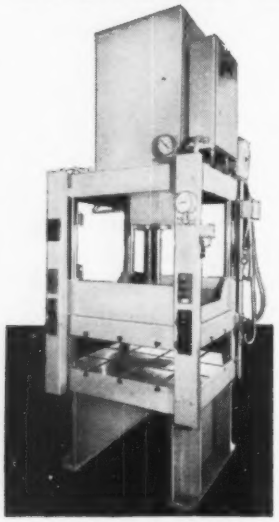
Cincinnati—Prices on the chief steelmaking grades of scrap moved up $1 to $3 a ton last week. There is no new mill buying, but dealers are reluctant to sell, and brokers think delivered prices will be definitely higher on the next mill purchase. No. 1 heavy melting is quoted at $40-$41, brokers' buying price.

Buffalo — The scrap market is quiet despite a pickup in steelmaking operations. Mills appear well stocked and in no hurry to buy.

Detroit—A slight pickup in steel buying has pushed up prices on open-hearth grades of scrap an average of $2 a ton.

St. Louis—Railroad scrap took a $1 to $6 a ton jump on recent offerings by several area roads. Rails were especially short. To lesser extent, supplies of other scrap grades are declining, as are mill invento-

SPECIAL MACHINES



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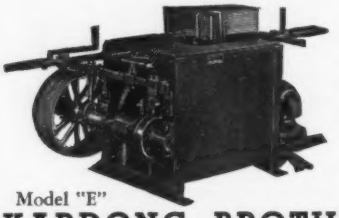

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ries. Ground stocks still are comfortable, but receipts are below the daily melt.

Birmingham—The scrap market is strong due to a supply scarcity here. Mills are having a hard time filling their needs. Brokers are offering premium prices in covering an order they accepted for No. 2 steel a couple weeks ago.

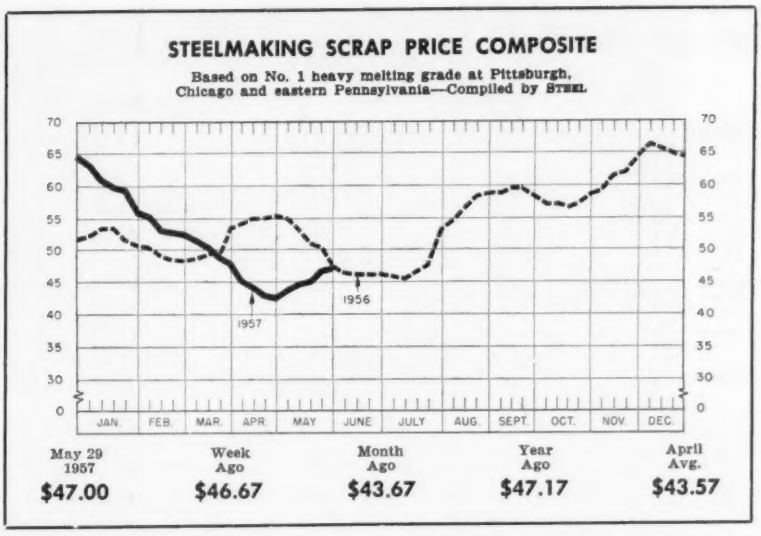
Washington—Domestic consumption of scrap and pig iron in March totaled 12,437,000 gross tons (6,284,000 tons, scrap, and 6,153,000 tons, pig iron), reports the Bureau of Mines. Compared with February figures, scrap use was up 4 per cent, pig iron 5 per cent.

Stocks of ferrous scrap held by consumers at the end of March amounted to 6,568,000 tons, compared with 6,523,035 tons at the end of February. Pig iron stocks were 2,176,000 tons, against 2,000,821.

San Francisco—Cast iron grades of scrap have been marked down $2 a ton in this market. Demand is slow, and the approaching holiday and vacation season is holding new buying in check.

Los Angeles — Prices are unchanged, but the scrap dealers in this area note a slightly firmer tone in the market. This reflects improved steelmaking operations, which are expected to stimulate buying.

Seattle — Prices are unchanged, but the market appears weaker and lower quotations are expected. Receipts are heavy and mills are adding to their inventories. Exports are less active.



Shipments Of Steel Products—March, 1957

(All grades; net tons)

Products	Carbon	Alloy	Stainless	Total Year To Date 1957	1956
Ingots, etc.	20,982	20,186	1,497	129,864	240,805
Blooms, slabs, etc.	233,454	47,989	2,502	687,906	680,348
Tube rounds	9,018	357	.....	25,734	1,242
Skelp	11,993	.....	.....	56,771	43,721
Wire rods	86,531	1,988	373	272,050	309,657
Structural shapes	607,378	6,863	36	1,677,696	1,369,154
Steel piling	53,746	.....	.....	145,730	101,247
Plates	817,584	59,351	4,563	2,421,479	1,998,377
Rails (standard)	125,333	2	.....	357,920	344,424
Rails (all other)	6,696	.....	.....	23,585	32,213
Joint bars	9,656	12	.....	23,389	20,753
Tie plates	29,858	.....	.....	86,301	99,553
Track spikes	7,850	.....	.....	21,148	29,321
Wheels	33,785	111	.....	97,886	91,716
Axles	18,555	26	.....	53,574	44,713
Bars, hot rolled	629,906	132,091	5,740	2,283,029	2,503,671
Bars, reinforcing	239,516	.....	.....	698,858	573,671
Bars, cold finished	98,083	24,215	5,783	399,260	527,135
Tool steel	1,577	8,555	.....	28,771	33,096
Standard pipe	260,472	68	.....	771,527	745,817
Oil country goods	245,835	39,807	.....	808,407	732,659
Line pipe	370,442	48	.....	1,036,208	860,520
Mechanical tubing	55,191	21,612	507	239,086	273,154
Pressure tubing	30,644	7,275	2,163	119,869	91,285
Wire, drawn	224,640	4,311	2,424	695,795	831,090
Nails & staples	41,566	.....	1	117,957	154,474
Barbed wire	8,347	.....	.....	19,854	28,101
Woven wire fence	24,055	.....	.....	67,025	87,015
Bale ties	6,789	.....	.....	12,574	11,812
Black plate	76,766	.....	.....	203,730	228,965
Tin plate (hot dipped)	113,593	.....	.....	264,807	272,168
Tin plate (electro)	618,827	.....	.....	1,518,337	1,404,984
Sheets, hot rolled	730,196	19,992	2,453	2,330,340	2,496,660
Sheets, cold rolled	1,007,536	3,394	14,843	3,341,100	3,908,300
Sheets, galvanized	206,847	11	.....	647,780	833,654
Sheets, other coated	18,299	.....	.....	55,195	70,589
Electrical sheets and strip	8,885	50,649	.....	183,720	223,882
Strip, hot rolled	129,584	2,663	693	427,987	527,965
Strip, cold rolled	87,076	1,320	18,077	337,532	479,673
Total, 1957	7,307,091	452,870	61,655	22,689,781	.....
Total, 1956	7,620,710	576,826	58,288	23,307,273	.....

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 150

Production of coke in March (6,895,073 net tons) was up 11 per cent over February's output, reports the Bureau of Mines. Of the total, 6,632,614 tons were oven coke, and 262,459 tons were beehive.

In March, 1956, output totaled 6,898,602 tons (6,625,374 oven coke, and 273,228 tons, beehive).

Output to the end of March was 19,966,811 net tons (19,202,910 tons, oven coke, and 763,901 tons, beehive). In the like period of 1956 the total was 20,302,110 tons (19,520,966 oven coke, and 781,144 tons, beehive).

Producers' stocks of oven coke at the end of March totaled 2,109,626 net tons, equal to 9.9 days' production. This compares with 1,673,648 tons (7.8 days) on the same date a year ago.

Warehouse . . .

Warehouse Prices, Page 149

Improved mill deliveries have created a more competitive selling situation for warehousemen. Mills have altered their sales policies on sheets and bars, taking more small orders and filling orders more quickly. The result is distributors' sales have declined and are expected to drop further in July. Demand for wide flange structurals and heavy plates is strong.

Most small users of steel indicate no interest in raising orders

(*Please turn to page* 162)

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL, May 29, 1957. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

May 29	$47.00
May 22	46.67
Apr. Avg.	43.57
May 1956	50.34
May 1952	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*46.00-47.00*
No. 2 heavy melting	*43.00-44.00*
No. 1 factory bundles	*51.00-52.00*
No. 1 dealer bundles	*46.00-47.00*
No. 2 bundles	*41.00-42.00*
No. 1 busheling	*46.00-47.00*
Machine shop turnings	31.00-32.00
Mixed borings, turnings	31.00-32.00
Short shovel turnings	35.00-36.00
Cast iron borings	35.00-36.00
Cut structurals, 3 ft lengths	51.00-52.00
Cut structurals, 2 ft and under	52.00-53.00
Heavy turnings	43.00-44.00
Punchings & plate scrap	51.00-52.00
Electric furnace bundles	51.00-52.00

Cast Iron Grades

No. 1 cupola	46.00-47.00
Heavy breakable cast	43.00-44.00
Unstripped motor blocks	34.00-35.00
No. 1 machinery cast	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	51.00-52.00
Rails, 2 ft and under	67.00-68.00
Rails, 18 in. and under	68.00-69.00
Rails, random lengths	61.00-62.00
Railroad specialties	*60.00-61.00*

Stainless Steel Scrap

18-8 bundles & solids	*300.00-310.00*
18-8 turnings	190.00-210.00
430 bundles & solids	75.00-80.00
430 turnings	55.00-60.00

CLEVELAND

No. 1 heavy melting	*45.00-46.00*
No. 1 factory bundles	*51.00-52.00*
No. 2 heavy melting	*39.00-40.00*
No. 1 bundles	*45.00-46.00*
No. 2 bundles	*37.00-38.00*
No. 1 busheling	*45.00-46.00*
Machine shop turnings	20.00-21.00
Short shovel turnings	23.00-24.00
Mixed borings, turnings	23.00-24.00
Cast iron borings	23.00-24.00
Cut foundry steel	*46.00-47.00*
Cut structurals, plates 2 ft and under	*52.00-53.00*
Low phos. punchings & plate	*46.00-47.00*
Alloy free, short shovel turnings	26.00-27.00
Electric furnace bundles	*46.00-47.00*

Cast Iron Grades

No. 1 cupola	*50.00-51.00*
Charging box cast	*39.00-40.00*
Heavy breakable cast	*39.00-40.00*
Stove plate	*47.00-48.00*
Unstripped motor blocks	*32.00-33.00*
Brake shoes	*39.00-40.00*
Clean auto cast	*50.00-51.00*
Burnt cast	*37.00-38.00*
Drop broken machinery	*52.00-53.00*

Railroad Scrap

No. 1 R.R. heavy melt.	48.00-49.00
R.R. malleable	*58.00-59.00*
Rails, 2 ft and under	*71.00-72.00*
Rails, 18 in. and under	*72.00-73.00*
Rails, random lengths	*66.00-67.00*
Cast steel	*57.00-58.00*
Railroad specialties	*61.00-62.00*
Uncut tires	*60.00-61.00*
Angles, splice bars	*61.00-62.00*
Rails, rerolling	*69.00-70.00*

Stainless Steel (Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	300.00-310.00
18-8 turnings	200.00-210.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	*48.00-49.00*
No. 2 heavy melting	*42.00-43.00*
No. 1 bundles	*48.00-49.00*
No. 2 bundles	*38.00-39.00*
No. 1 busheling	*48.00-49.00*
Machine shop turnings	20.00-21.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	*49.00-50.00*
Electric furnace bundles	*49.00-50.00*

Railroad Scrap

No. 1 R.R. heavy melt.	50.00-51.00

CHICAGO

No. 1 hvy melt., indus.	43.00-44.00
No. 1 hvy melt., dealer	41.00-42.00
No. 2 heavy melting	39.00-40.00
No. 1 factory bundles	46.00-47.00
No. 1 dealer bundles	41.00-42.00
No. 2 bundles	34.00-35.00
No. 1 busheling, indus.	43.00-44.00
No. 1 busheling, dealer	41.00-42.00
Machine shop turnings	26.00-27.00
Mixed borings, turnings	28.00-29.00
Short shovel turnings	28.00-29.00
Cast iron borings	28.00-29.00
Cut structurals, 3 ft	49.00-50.00
Punching & plate scrap	50.00-51.00

Cast Iron Grades

No. 1 cupola	42.00-43.00
Stove plate	40.00-41.00
Unstripped motor blocks	32.00-33.00
Clean auto cast	47.00-48.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	49.00-50.00
R.R. malleable	55.00-56.00
Rails, 2 ft and under	61.00-62.00
Rails, 18 in. and under	62.00-63.00
Angles, splice bars	56.00-57.00
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	310.00-315.00
18-8 turnings	210.00-215.00
430 bundles & solids	75.00-80.00
430 turnings	50.00-55.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*40.00-41.00*
No. 2 heavy melting	*33.00-34.00*
No. 1 bundles	*40.00-41.00*
No. 2 bundles	*32.00-33.00*
No. 1 busheling	*38.00-39.00*
Machine shop turnings	23.00-24.00
Mixed borings, turnings	24.00-25.00
Short shovel turnings	25.00-26.00
Punchings & plate scrap	*47.00-48.00*

Cast Iron Grades

No. 1 cupola	*46.00*
Charging box cast	*41.00*
Stove plate	41.00
Heavy breakable	36.00
Unstripped motor blocks	28.00
Clean auto cast	*48.00*
Malleable	52.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	41.00
No. 2 heavy melting	37.00
No. 1 bundles	41.00
No. 2 bundles	32.00
No. 1 busheling	41.00
Machine shop turnings	*25.00*
Short shovel turnings	27.00

Cast Iron Grades

No. 1 cupola	*44.00*
Charging box cast	37.00
Heavy breakable cast	37.00
Unstripped motor blocks	37.00
Brake shoes	40.00
Clean auto cast	48.00
Stove plate	*40.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*49.25*
Rails, 18 in. and under	*65.00*
Rails, rerolling	*65.00*
Rails, random lengths	*60.00*
Angles, splice bars	*59.00*

PHILADELPHIA

No. 1 heavy melting	52.00
No. 2 heavy melting	43.00
No. 1 bundles	54.00
No. 2 bundles	42.00
No. 1 busheling	54.00
Electric furnace bundles	55.00
Mixed borings, turnings	36.00
Short shovel turnings	37.50-38.00
Machine shop turnings	34.50-35.00
Heavy turnings	48.00
Structurals & plate	54.00-56.00
Couplers, springs, wheels	60.00
Rail crops, 2 ft & under	67.00-69.00

Cast Iron Grades

No. 1 cupola	46.00
Heavy breakable cast	55.00
Malleable	62.00
Drop broken machinery	57.00-58.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*47.00-48.00*
No. 2 heavy melting	*37.00-38.00*
No. 1 bundles	47.00-48.00
No. 2 bundles	*35.00-36.00*
Machine shop turnings	26.00-27.00
Mixed borings, turnings	29.00-30.00
Short shovel turnings	30.00-30.50
Low phos. (structurals & plate)	49.00-50.00

Cast Iron Grades

No. 1 cupola	*44.00-45.00*
Unstripped motor blocks	*35.00-36.00*
Heavy breakable	46.00-47.00

Stainless Steel

18-8 sheets, clips solids	*300.00*
18-8 borings, turnings	200.00
430 sheets, clips, solids	60.00-70.00
410 sheets, clips, solids	50.00-60.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*39.50-40.50*
No. 2 heavy melting	29.50-31.00
No. 1 bundles	*39.50-40.50*
No. 2 bundles	28.00-29.00
No. 1 busheling	*39.50-40.50*
Machine shop turnings	*23.00-24.00*
Mixed borings, turnings	*25.00-25.50*
Short shovel turnings	26.00-26.50
No. 1 cast	34.00-35.00
Mixed cupola cast	33.00-34.00
No. 1 machinery cast	42.00-43.00

BUFFALO

No. 1 heavy melting	40.00-41.00
No. 2 heavy melting	36.00-37.00
No. 1 bundles	40.00-41.00
No. 2 bundles	33.00-34.00
No. 1 busheling	40.00-41.00
Mixed borings, turnings	29.00-30.00
Machine shop turnings	27.00-28.00
Short shovel turnings	30.00-31.00
Cast iron borings	29.00-30.00
Low phos.	*46.00-47.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	41.00-42.00
No. 1 machinery	46.00-47.00

Railroad Scrap

Rails, random lengths	53.00-54.00
Rails, 3 ft and under	59.00-60.00
Railroad specialties	47.00-48.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*40.00-41.00*
No. 2 heavy melting	*35.00-36.00*
No. 1 bundles	*40.00-41.00*
No. 2 bundles	*32.00-33.00*
No. 1 busheling	*40.00-41.00*
Machine shop turnings	*26.00-27.00*
Mixed borings, turnings	*24.00-25.00*
Short shovel turnings	*28.00-29.00*
Cast iron borings	*24.00-25.00*
Low phos. 18 in.	*50.00-51.00*

Cast Iron Grades

No. 1 cupola	43.00-44.00
Heavy breakable cast	42.00-43.00
Charging box cast	42.00-43.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	*42.00-43.00*
Rails, 18 in. and under	*65.00-66.00*
Rails, random lengths	*55.00-56.00*

BIRMINGHAM

No. 1 heavy melting	*40.00-41.00*
No. 2 heavy melting	*36.00-37.00*
No. 1 bundles	*40.00-41.00*
No. 2 bundles	*28.00-29.00*
No. 1 busheling	*40.00-41.00*
Cast iron borings	26.00-27.00
Short shovel turnings	30.00-31.00
Machine shop turnings	28.00-29.00
Bar crops and plates	49.00-50.00
Structurals & plate	*49.00-50.00*
Electric furnace bundles	45.50-46.50
Electric furnace:	
3 ft and under	43.50-44.50
2 ft and under	44.50-45.50

(F.o.b. shipping point)

Cast Iron Grades

No. 1 cupola	*49.00-50.00*
Stove plate	*49.00-50.00*
Unstripped motor blocks	*40.00-41.00*
Charging box cast	34.00-35.00
No. 1 wheels	37.00-38.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00-42.00
Rails, 18 in. and under	58.00-59.00
Rails, rerolling	60.00-61.00
Rails, random lengths	50.00-51.00
Angles, splice bars	53.00-54.00

SEATTLE

No. 1 heavy melting	48.00
No. 2 heavy melting	45.00
No. 1 bundles	45.00
No. 2 bundles	26.00-28.00
Machine shop turnings	28.00-30.00
Mixed borings, turnings	28.00-30.00
Electric furnace No. 1	56.00

Cast Iron Grades

No. 1 cupola	50.00
Heavy breakable cast	48.00
Unstripped motor blocks	40.00
Stove plate (f.o.b. plant)	42.00

LOS ANGELES

No. 1 heavy melting	46.00
No. 2 heavy melting	43.00
No. 1 bundles	47.00
No. 2 bundles	33.00
Machine shop turnings	32.00
Shoveling turnings	33.00
Cast iron borings	34.00
Cut structural and plate, 1 ft and under	57.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	54.00

Railroad Scrap

No. 1 R.R. heavy melt.	48.00

SAN FRANCISCO

No. 1 heavy melting	48.00
No. 2 heavy melting	43.00
No. 1 bundles	47.00
No. 2 bundles	35.00
Machine shop turnings	32.00
Mixed borings, turnings	32.00
Cast iron borings	32.00
Heavy turnings	32.00
Short shovel turnings	34.00
Cut structurals, 3 ft	60.00

Cast Iron Grades

No. 1 cupola	*53.00*
Charging box cast	*45.00-47.00*
Stove plate	*46.00*
Heavy breakable cast	*40.00*
Unstripped motor blocks	*48.00*
Clean auto cast	*55.00*
No. 1 wheels	*48.00*
Drop broken machinery	*53.00*

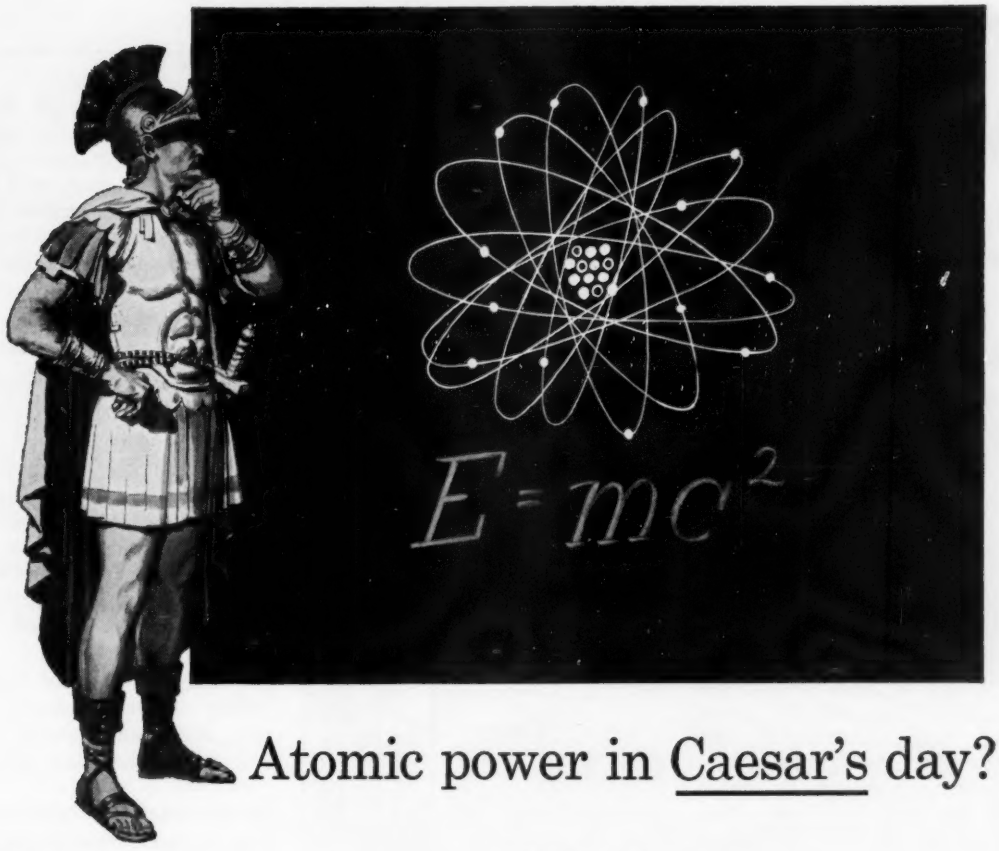
HAMILTON, ONT.

No. 1 heavy melting	43.00
No. 2 heavy melting	38.00
No. 1 bundles	43.00
No. 2 bundles	32.00
Mixed steel scrap	35.00
Mixed borings, turnings	19.00
Busheling, new factory:	
Prepared	43.00
Unprepared	37.00
Short steel turnings	30.00
Rails, rerolling	49.00

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b. Hamilton, Ont.



Atomic power in Caesar's day?

Certainly!

It was there, in the ground, in the air and water. It always had been. There are no more "raw materials" today than there were when Rome ruled the world.

The only thing new is knowledge . . . knowledge of how to get at and rearrange raw materials. Every invention of modern times was "available" to Rameses, Caesar, Charlemagne.

In this sense, then, we have available *today* in existing raw materials the inventions that can make our lives longer, happier, and inconceivably easier. We need only *knowledge* to bring them into reality.

Could there possibly be a better argument for the strengthening of our *sources* of knowledge—our colleges and universities? Can we possibly deny that the welfare, progress—indeed the very *fate*—of our nation depends on the quality of knowledge generated and transmitted by these institutions of higher learning?

It is almost unbelievable that a society such as ours, which has profited so vastly from an accelerated accumulation of knowledge, should allow anything to threaten the wellsprings of our learning.

Yet this is the case

The crisis that confronts our colleges today threatens to weaken seriously their ability to produce the kind of graduates who can assimilate and carry forward our rich heritage of learning.

The crisis is composed of several elements: a salary scale that is driving away from teaching the kind of mind *most qualified* to teach; overcrowded classrooms; and a mounting pressure for enrollment that will *double* by 1967.

In a very real sense our personal and national progress depends on our colleges. They *must* have our aid.

Help the colleges or universities of your choice. Help them plan for stronger faculties and expansion. The returns will be greater than you think.

If you want to know what the college crisis means to you, write for a free booklet to: HIGHER EDUCATION, Box 36, Times Square Station, New York 36, New York.

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Competitive Summer Ahead

Nonferrous men look for no upturn until fourth quarter. Because of general wage increases, some metal prices could rise. But with a sagging market, they may hold the line

Nonferrous Metal Prices, Pages 160 & 161

IT'S going to be a competitive summer for the nonferrous industry.

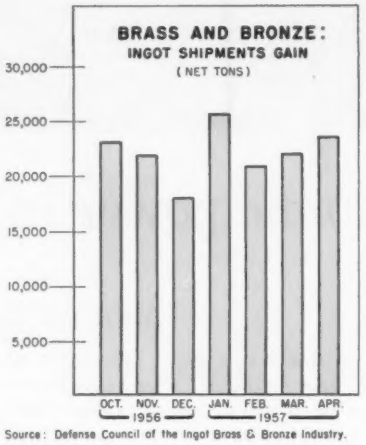
Third and fourth quarter outlook: 1. Vacation taking and the historical third quarter dip in business will combine to put pressure for further price declines on nonferrous producers. 2. Look for the market to strengthen during the fourth quarter.

Price Pressures—Aluminum and copper are being produced under three-year labor contracts. This means that during the third quarter wages will be increased 6.5 to 13 cents an hour. With sagging markets, both aluminum and copper men will do everything possible to keep from increasing prices. Aluminum ingot is 27.10 cents a pound, and primary copper is 32 cents a pound. Industry observers are betting that price hikes will not come before an upturn in the business cycle in the fourth quarter.

Orders for brass mill products are still on a hand-to-mouth basis, reflecting the disappointing conditions in the automotive and appliance industries. Copper wire and cable producers are still operating at high levels but are being forced to sharpen their estimating pencils to obtain orders. Rolling mills, working with aluminum and copper, report business is average.

Western aluminum demand is up as aircraft orders flow in. National outlook: Supply should continue to outstrip demand for the remainder of the year.

Lead, Zinc—Even though the Office of Defense Mobilization will make June purchases of both metals (it is anticipated that it will take about twice as much as normal), this will still not help firm the lead and zinc markets and assure that prices will hold at current levels. It will take the reinstitution of the barter program (surplus American grain for foreign origin lead and zinc), sustained monthly purchases by ODM and a general upturn in demand during the fourth quarter.



Source: Defense Council of the Ingot Brass & Bronze Industry.

Titanium—Mills are working at capacity. The government continues to be the prime purchaser of mill products. With sponge prices at $2.75 a pound, civilian users are still price shy. Look for at least one more reduction in the sponge price (to the $2.50 a pound level) by the end of the third quarter. As more companies enter the field, look for a competitive battle for civilian markets. Mills will operate near the 100 per cent mark during the last half.

Market Memos

• Job electroplaters and suppliers who have been screaming for over a year about unequitable distribution are getting about an extra million pounds of nickel sinter and anodes. Steelmakers report (off the record) that they can get all of the nickel they need to supply current requirements for nickel grade steels. Premium price dealers ($1 to $2 a pound) are finding few takers.

• Some 100,000 lb of lithium are being produced annually, reports the American Lithium Institute. About 1 million lb a year may be produced by 1970.

• American Zinc, Lead & Smelting Co. is closing down it zinc and lead mine at Picher, Okla., for an indefinite period. About 100 workers are involved. "The present prices for zinc and lead make it impossible to operate this property at a profit," declares Howard I. Young, president.

• Anaconda Aluminum Co. shut off one-eighth of its reduction capacity at Columbia Falls, Mont., last Saturday and will shut off another one-eighth by July 1, reports H. G. Satterthwaite, plant manager. Reason: An excessive amount of unsold aluminum at the plant.

NONFERROUS PRICE RECORD

	Price May 28	Last Change	Previous Price	Apr. Avg.	Mar. Avg.	May, 1956 Avg.
Aluminum	27.10	Aug. 10, 1956	25.90	27.100	27.100	25.900
Copper	30.00-32.00	May 9, 1957	30.50-32.00	31.598	31.462	45.096
Lead	14.80	May 16, 1957	15.30	15.800	15.800	15.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	33.750
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	64.500
Tin	98.375	May 24, 1957	98.25	99.276	99.683	97.024
Zinc	11.50	May 14, 1957	11.50-12.00	13.500	13.500	13.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

BRIDGEPORT BRASS
COPPER ALLOY BULLETIN

Reporting New Developments in Copper-Brass Alloys and Metalworking Methods

SPECIFY DURONZE WHEN YOU NEED A TOUGH, DURABLE ALLOY

by M. A. BUELL
Chief Staff Metallurgist

Duronze is one of the more versatile of the bronzes, combining the strong corrosion-resistant properties of copper with many of the mechanical properties of mild steel. It is available in several alloy compositions, the most popular of which are as follows:

	Duronze 606	Duronze 609	Duronze 707
Copper	96.00%	98.0%	91.0%
Silicon	2.85	2.0	2.0
Aluminum	–	–	7.0
Manganese	1.00	–	–

The Duronze family's high tensile strength and good machining make it a popular alloy for bolts, nuts, gears, valve stems and parts, and marine hardware.

Duronze 707 is best for machined and hot-forged parts. It does not, however, lend itself to cold-forming operations.

Duronze 606 and 609 offer, on the other hand, excellent cold-working properties in addition to excellent corrosion resistance.

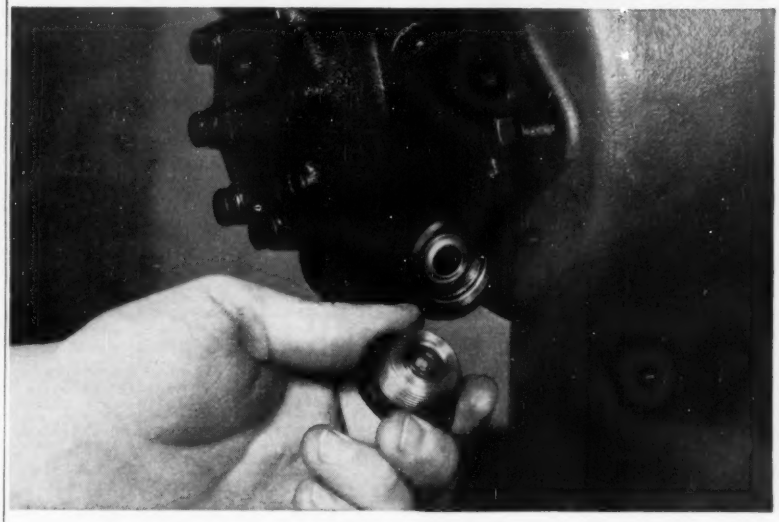
Full details on any Duronze alloy are available from your nearest Bridgeport Sales Office.

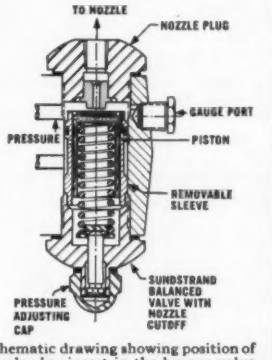
SOLVING YOUR PRODUCT AND PRODUCTION PROBLEMS

Of all the data, records and files kept by Bridgeport Technical Service, one of the largest is marked "Product and Production Problems —Solved." The experience brought to bear on a problem you may have with your product, or in the production of it, comes, in large measure, from cases similar to yours and frequently from cases exactly like yours.

Couple this successful experience with extensive facilities and you have a combination at your disposal that can be of great benefit to you. Bridgeport Technical Service works directly through your Bridgeport Salesman; when you outline for him your particular copper alloy problem you're calling on Bridgeport Technical Service.

Bridgeport Duronze 707 Helps Cut Cost of Vital Oil-Burner Pump Part





Schematic drawing showing position of nozzle plug insert in the burner valve assembly.

Bridgeport Duronze 707 nozzle port insert shown with nozzle plug.

The nozzle port insert for oil-burner pumps manufactured by Sundstrand Hydraulic Div., Sundstrand Machine Tool Co., Rockford, Ill., performs two vital functions: it provides positive fuel cutoff and prevents fuel leakage during stand-by periods.

For these reasons, metals specifications and machining requirements are exacting. Resistance to continual corrosive effects of fuel is a must. Also, the material for the part has to be machined to close tolerances and must be capable of good surface finishes.

A Bridgeport salesman noticed that this insert was being machined from leaded phosphor bronze. He studied the materials specifications and production methods, then recommended a shift to Bridgeport Duronze 707 (Aluminum Silicon Bronze).

First, Duronze made possible substantial savings in materials cost. Second, Duronze's resistance to fuel-oil corrosion was equally as good as the previously used metal. Third, although the machinability of Duronze was slightly less than leaded phosphor bronze, the Bridgeport man's recommendations made the difference in machining time negligible.

The results speak for themselves. Sundstrand now uses Bridgeport Duronze 707 for the nozzle port insert on their *entire* line of oil-burner pumps.

BRIDGEPORT BRASS
Bridgeport Brass Company, Bridgeport 2, Connecticut. Offices in Principal Cities
In Canada: Noranda Copper and Brass Limited, Montreal

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots, 27.10; pigs, 25.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.90; No. 43, 28.70; No. 195, 30.30; No. 241, 30.50; No. 356, 28.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100-lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 32.00 deld. Conn. valley; 32.00 deld. Midwest; custom smelters, 30.00 deld.; lake, 32.00 deld.; fire refined, 31.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U.S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $100-110 nom. per troy oz.

Lead: Common, 14.80; chemical, 14.90; corroding, 14.90, St. Louis. New York basis, add 0.20.

Lithium: 98+%, cups or ingots, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex., 13 in. sticks, 59.00 f.o.b. Madison Ill.

Magnesium Alloys: AZ91B (die casting), 37.25 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $255-257 per 76-lb flask.

Molybdenum: Extruded ingot, $9.60 per pound, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot or ingots for addition to cast iron, 74.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01.

Osmium: $80-100 per troy oz, nom.

Palladium: $23-24 per troy oz.

Platinum: $90-95 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: 99.5%, $12-15 per lb.

Silver: Open market, 91.375 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Rod, $58.06 per lb; sheet, $45.36 per lb.

Tellurium: $1.60-1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N.Y., spot and prompt, 98.375.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max.), $2.75; grade A-2 (0.5% Fe max.), $2.50 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.00 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $4.75.

Zinc: Prime Western, 11.50; brass special, 11.75; intermediate, 12.00; East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.85; special high grade, 13.25 deld. Die casting alloy ingot No. 3, 15.50; No. 2, 16.50; No. 5, 16.00 deld.

Zirconium: Sponge, commercial grade, $10 per lb.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.00-28.25, No. 12 foundry alloy (No. 2 grade), 21.00-22.00; 5% silicon alloy, 0.60 Cu max., 24.00-24.50; 13 alloy, 0.60 Cu max., 24.00-24.50; 195 alloy, 23.75-25.25; 108 alloy, 21.50-22.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.75; grade 2, 21.00; grade 3, 20.00; grade 4, 19.25.

Brass Ingot: Red brass, No. 115, 30.50; tin bronze, No. 225, 40.00; No. 245, 34.50; high-leaded tin bronze, No. 305, 34.50; No. 1 yellow, No. 405, 25.00; manganese bronze, No. 421, 28.00.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 37.50; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.83-1.86, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.80, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 37.355; l.c.l., 37.98. Weatherproof, 30,000-lb lots, 37.78; l.c.l., 38.53. Magnet wire deld., 15,000 lb or more, 44.68; l.c.l., 45.43.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $20.50 per cwt; pipe, full coils, $20.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $11.00-14.75; sheared mill plate, $9.25-11.25; wire, $8.50-11.00; forging billets, $6.85-7.10; hot-rolled and forged bars, $7.10-7.35.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 21.00; plates, 19.50.

ZIRCONIUM

Plate, $20.35; H.R. strip, $23.95; C.R. strip, $32.00; forged or H.R. bars, $18.40; wire, 0.015 in., 8.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheet and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.249-0.138	40.90-45.40	....
0.135-0.096	41.40-46.50	37.70-39.60
0.095-0.077	42.10-48.30	37.80-39.80
0.076-0.061	42.70-50.60	38.20-40.50
0.060-0.048	43.40-52.90	38.80-41.50
0.047-0.038	43.90-55.60	38.60-42.90
0.037-0.030	44.30-50.00	40.40-44.70
0.029-0.024	44.90-52.40	41.00
0.023-0.019	45.80-52.20	42.00
0.018-0.017	46.50-53.30	42.60
0.016-0.015	47.50-53.90	43.40
0.014	48.50-50.90	44.40
0.013-0.012	49.70-52.10	45.10
0.011	50.70-53.70	46.30
0.010-0.0095	52.10-54.40	47.60
0.009-0.0085	53.40	49.10
0.008-0.0075	55.00	50.03
0.007	56.50	51.80
0.006	58.10	53.20

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	40.2	44.5
5050-F	41.3	45.6
3004-F	42.3	47.5
5052-F	42.9	48.2
6061-T6	44.4	50.0
2024-T4*	48.1	54.4
7075-T6*	55.4	62.5

*24-48 in. width or diam., 72-180 lengths.

Screw Machine Stock: 30,000 lb base.

Diam.(in.)or across flats	——Round—— 2011-T3	2017-T4	—Hexagonal— 2011-T3	2017-T4
Drawn				
0.125	74.30	71.50	....	....
0.156-0.172	63.00	60.40	....	....
0.188	63.00	60.40	....	76.40
0.219-0.234	59.70	57.20	....	....
0.250-0.281	59 70	57.20	....	73.00
0.313	59.70	57.20	....	69.60
0.344	58.50	....	....	....
Cold-Finished				
0.375-0.547	58.80	57.50	70.10	65.50
0.563-0.688	58.80	57.50	66.70	61.60
0.750-1.000	57.40	56.00	61.00	58.10
1.063	57.40	56.00	....	56.10
Rolled				
1.125-1.500	55.20	53.90	59.00	56.10
1.563	53.70	52.40	....	....
1.625-2.000	53.10	51.60	....	....
2.125-2.500	51.70	50.30	....	....
2.563-3.375	50.20	48.70	....	....

Forging Stock: Round, Class 1, 43.30-55.90 in specific lengths, 36-144 in., diam. 0.375-8 in. Rectangles and squares, Class 1, 48.10-63.20 in random lengths, 0.375-4 in. thick, width 0.0750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$18.45	2	$ 57.00
1	29.00	4	157.20
1½	39.25	6	281.65
1½	46.95	8	423.80

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	43.10-44.60	57.80-61.80
12-14	43.40-44.80	58.40-62.70
15-17	43.60-45.40	59.60-64.30
18-20	44.10-45.80	61.50-66.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Thread plate, .188 in., 71.70; .250-2.00 in., 70.60. Tooling plates, .250-3.0 in., 73.0.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.00-13.50; old sheets, 9.50-10.00; borings and turnings, 6.50-

BRASS MILL PRICES

MILL PRODUCTS a — SCRAP ALLOWANCES f

	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	54.13b	51.36c	....	54.32	28.000	28.000	27.250
Yellow Brass	46.85	34.97d	47.39	49.76	21.250	21.000	19.375
Low Brass, 80%	49.80	49.74	50.34	52.61	23.750	23.500	23.000
Red Brass, 85%	50.84	50.78	51.38	53.65	24.750	24.500	24.000
Com. Bronze, 90%	52.43	52.42	53.02	55.04	25.750	25.500	25.500
Manganese Bronze	54.65	48.75	59.25	....	19.750	19.500	19.000
Muntz Metal	48.99	44.80	....	....	20.000	19.750	19.250
Naval Brass	50.91	45.22	57.97	54.32	19.750	19.500	19.000
Silicon Bronze	58.60	57.79	58.64	60.68e	27.375	27.125	26.375
Nickel Silver, 10%	63.56	65.89g	65.89	....	27.750	27.750	13.750
Phos. Bronze, A-5%	73.17	73.67	73.67	74.85	28.875	28.625	27.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

7.00; crankcases, 9.50-10.00; industrial castings, 9.50-10.00.

Copper and Brass: No. 1 heavy copper and wire, 23.00-23.50; No. 2 heavy copper and wire, 21.50-22.00; light copper, 19.75-20.25; No. 1 composition red brass, 20.00-20.50; No. 1 composition turnings, 19.50-20.00; yellow brass turnings, 11.50-12.00; new brass clippings, 19.00-19.50; light brass, 12.00-12.50; heavy yellow brass, 14.00-14.50; new brass rod ends, 16.50-17.00; auto radiators, unsweated, 15.00-15.50; cocks and faucets, 16.50-17.00; brass pipe, 17.00-17.50.

Lead: Heavy, 10.50-11.00; battery plates, 5.75-6.00; linotype and stereotype, 12.75-13.25; electrotype, 12.25-12.75; mixed babbitt, 12.00-12.50.

Monel: Clippings, 45.00-48.00; old sheets, 45.00-48.00; turnings, 35.00-38.00; rods, 45.00-48.00.

Nickel: Sheets and clips, 80.00-90.00; rolled anodes, 80.00-90.00; turnings, 65.00-75.00; rod ends, 80.00-85.00.

Zinc: Old zinc, 3.00-3.50; new die-cast scrap, 2.75-3.50; old die-cast scrap, 1.50-2.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 16.50; 3003 clippings, 16.50; 6151 clippings, 16.50; 5052 clippings, 16.00-16.50; 2014 clippings, 15.50-16.00; 2017 clippings, 15.50-16.00; 2024 clippings, 15.50-16.00; mixed clippings, 15.00; old sheets, 13.00-13.50; old cast, 13.00-13.50; clean old cable (free of steel), 15.50-16.50; borings and turnings, 13.50-14.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 54.00; light scrap, 49.00; turnings and borings, 34.00.

Copper and Brass: No. 1 heavy copper and wire, 26.50; No. 2 heavy copper and wire, 24.25; light copper, 22.00; refinery brass (60% copper) per dry copper content, 23.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 26.50; No. 2 heavy copper and wire, 24.25; light copper, 22.00; No. 1 composition borings, 22.50; No. 1 composition solids, 23.00; heavy yellow brass solids, 17.00; yellow brass turnings, 16.00; radiators, 17.75.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 50.29; oval, 49.42, 5000-10,000 lb; electrodeposited, 39.25, 2000-5000 lb lots; cast, 44.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 101.50; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 116.50; 200-499 lb, 115.00; 500-999 lb, 114.50; 1000 lb or more, 114.00.

Zinc: Balls, 18.59; flat tops, 18.25; flats, 22.75; ovals, 22.00, ton lots.

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Write Box 550, STEEL
Penton Bldg., Cleveland 13, Ohio

CLASSIFIED

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GROWING COMPANY LOCATED IN EASTERN Pennsylvania wants active representation in Western Pennsylvania and Eastern Ohio. Salesman should now be selling to Structural Steel Fabricators in above area. Our line can be carried along with non competitive items. Must be able to read structural and architectural prints. Commission basis. Address Box No. 559, STEEL, Penton Bldg., Cleveland 13, Ohio.

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CERAMIC ENGINEER WANTED
Ceramic Engineer to head complete ceramic laboratory. To supervise and run development tests. Preferably refractory specialties and fire brick experience. Some traveling for sales department will be necessary. Box 561, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Experienced in Rolling Mills

6 INDUSTRIAL ENGRS	$7-16,000
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Wabash Agency 202 S. State
Chicago

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Large eastern steel producer has an opening for a man with a minimum of three years experience in basic steel. Prefer applicant to be over thirty years of age. Splendid opportunity for advancement.

Write Box 555, STEEL
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Apply by letter giving full particulars of experience.

Box 560, STEEL
Penton Bldg. Cleveland 13, Ohio

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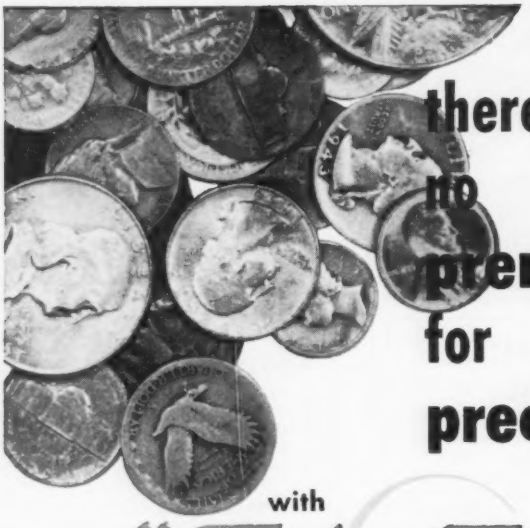
● **Would you like** to work for one of the giants in the electrical field, progressive and growing fast?

● **Would you like** to live in a city abounding in all types of sports and recreational activities, and famous as a place to bring up a family?

If you are an electrical engineer with experience in either the Maintenance or Electrical Engineering departments of a primary metal producing company, it will pay you to investigate this opportunity.

For details write to Box 557, STEEL, Penton Bldg., Cleveland 13, Ohio.



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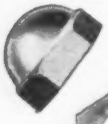
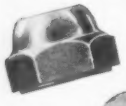
"Fischer Turned"

BRASS AND ALUMINUM NUTS





Costing no more than nuts produced by other, less accurate methods, Fischer precision-turned brass and aluminum nuts make possible important savings in assembly operations. Check these advantages:

Countersunk on both sides for faster starting . . .

Tapped square with face to Class 2 tolerances for smoother, easier running and superior bearing surfaces . . .

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TURNED NUTS Fischer SPECIAL MFG. CO. CINCINNATI OHIO SINCE 1905

C-224-FS

(*Concluded from page* 155)

for June delivery to beat the expected price increase. They expect their July needs will be low.

Tubular Goods . . .

Tubular Goods Prices, Page 148

Improved supplies of seamless pipe, 12-in. and under, have enabled distributors to attain better inventory balance in New England. Direct mill shipments are closer to schedule and in heavier volume. As a result, utility requirements, which are substantial, are being met. Some utilities are revising their estimated requirements now that pipe is in freer supply.

July delivery orders for oil country tubular goods, pressure tubing and most seamless specialties are encouragingly large. The market picture is not as bright in welded pipe and mechanical tubing.

Sellers say sales to the construction industry are not as strong as they usually are at this season. The decline in housing starts is a factor.

A seasonal decline in mechanical tubing sales reflects the approaching model change-over period in the auto industry.

Canada . . .

Vancouver, B. C.—With a backlog that insures capacity operations through 1958, the Pacific Division, Dominion Bridge Co. Ltd., has inaugurated a $5 million, four-year expansion program. Its largest current contract involves 16,000 tons of shapes for the Second Narrows bridge for the British Columbia Highways & Bridge Authority.

Booked to the end of 1957 and taking 1958 delivery orders, Western Bridge & Steel Fabricators, Vancouver, is operating fully.

Expanded operations are planned by Vancouver Rolling Mills Ltd., Vancouver, producers of channels, angles and rounds. Trigg Island in the Fraser river has been acquired for a melt shop site. The company's melting capacity will be increased to 110,000 tons with the installation, early next year, of a British-built electric furnace.

This plant has a backlog that will carry it to the end of 1957 at capacity. Most of its output is distributed through fabricators and warehouses.

Advertising Index

Aetna-Standard Engineering Co., The ..... Inside Back Cover
Ajax Electric Co. 137
Ajax Electric Motor Corporation 161
Alco Products Co. 43
Allis-Chalmers ..... Inside Front Cover
Alloy Metal Products, Inc. 134
American Air Filter Co., Inc. 82
American Brake Shoe Co., National Bearing Division 139
American Machine & Foundry Co., Cleveland Welding Division 140
American MonoRail Co. 24
American Steel & Wire Division, United States Steel Corporation 38, 39
American Welding & Manufacturing Co., The 44
Anaconda Wire & Cable Co. 103
Atlas Car & Mfg. Co., The 10

Baker-Raulang Co., The 3
Bethlehem Steel Co. 1
Birdsboro Steel Foundry & Machine Co. ..40, 41
Borg-Warner Corporation, Ingersoll Steel Division 151
Bridgeport Brass Co. 159

Chambersburg Engineering Co. 151
Chandler Products Corporation 23
Chase Brass & Copper Co. 75
Chrysler Corporation, Industrial Engine Division 27
Cincinnati Grinders, Inc. 59
Cincinnati Shaper Co., The 32, 33
Cities Service Oil Co. 68
Cleveland Hotel 16
Cleveland Punch & Shear Works Co., The 106
Cleveland Tramrail Division, The Cleveland Crane & Engineering Co. 50
Cleveland Welding Division, American Machine & Foundry Co. 140
Cold Metal Products Co., The 132
Columbia-Geneva Steel Division, United States Steel Corporation 38, 39
Composite Forgings, Inc. 154
Cone Automatic Machine Co., Inc. 17
Crucible Steel Company of America 99
Cullen-Friestedt Co. 138

Despatch Oven Co. 13
Detroit Steel Corporation 48
Diamond Manufacturing Co. 71
Dresser Industries, The, Dresser Manufacturing Division 153
Duff-Norton Co. 102
Duraloy Co., The 110

Eastern Constructors, Inc. 136
Eastman Kodak Co., X-ray Division 131
Eaton Manufacturing Co., Dynamatic Division . 42
Enthone, Inc. 60
Erie Forge & Steel Corporation 26

Fairfield Manufacturing Co. 142
Fischer Special Mfg. Co. 162
Frasse, Peter A., & Co., Inc. 7

General Electric Co., Metallurgical Products Department 34, 35
Globe Steel Abrasive Co., The 111
Great Lakes Steel Corporation 64
Greenlee Bros. & Co. 109

Hanna Furnace Corporation, The 96
Harnischfeger Corporation, Industrial Division 36
Haynes Stellite Co., Division of Union Carbide Corporation 18, 19
Heppenstall Co. 72
Hill Acme Co., The 153
Hobart Brothers Co. 6

Illinois Gear & Machine Co. 8
Industrial Brownhoist Corporation 81
Ingersoll Steel Division, Borg-Warner Corporation 151

James, D. O., Gear Mfg. Co. 151
Jones & Laughlin Steel Corporation 95, 101

Kardong Brothers, Inc. 154

Landis Machine Co. 14, 15
Lanham Skid Co., The 138
Lynchburg Foundry Co. 77

Metallurgical Products Department of General Electric Co. 34, 35
Miller, Harry, Corporation 9
Monarch Aluminum Mfg. Co. 37
Morgan Engineering Co., The 20, 21

National Bearing Division, American Brake Shoe Co. 139
National Galvanizing Co. 161
National Steel Corporation 64, 96
Nicholson File Co. 22

Oakite Products, Inc. 112
Ohio Crankshaft Co., The 2
Ohio Ferro-Alloys Corporation 93
Orban, Kurt, Co., Inc. 141

Pannier Corporation, The 153
Peterson Steels, Inc. 113
Porter, H. K., Company, Inc., Riverside-Alloy Metal Division 12

Reliance Electric & Engineering Co. 30
Republic Steel Corporation 28, 29
Riverside-Alloy Metal Division, H. K. Porter Company, Inc. 12
Ryerson, Joseph T., & Son, Inc. 47

Salem-Brosius, Inc. 11
Square D Co. 78
Standard Pressed Steel Co., Unbrako Socket Screw Division 31

Tennessee Coal & Iron Division, United States Steel Corporation 38, 39
Timken Roller Bearing Co., The ... Back Cover

Union Carbide Corporation, Haynes Stellite Division 18, 19
United States Rubber Co., Mechanical Goods Division 91
United States Steel Corporation, Subsidiaries 38, 39
United States Steel Export Co. 38, 39

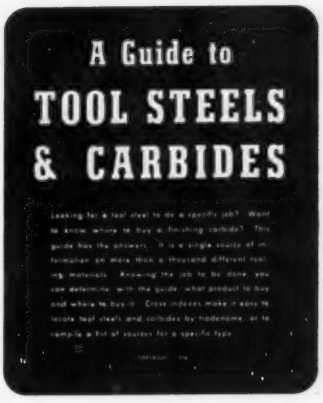
Veeder-Root, Inc. 4
Verson Allsteel Press Co. 67

Wales-Strippit Co. 114
Ward Steel Co. 70
Wassell Organization, Inc. 70
Wean Engineering Co., The 25

~ ~ ~

Table of Contents, Page 5

Classified Advertising, Page 161



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Looking for a tool steel to do a specific job? Want to know where to buy a finishing carbide? This guide has the answers. It is a single source of information on more than a thousand different tooling materials. Knowing the job to be done, you can determine, with the guide, what product to buy and where to buy it. Cross indexes make it easy to locate tool steels and carbides by tradename, or to compile a list of sources for a single type.

40 PAGES

Copies of the Guide to Tool Steels & Carbides are available from Editorial Service, STEEL, Penton Bldg., Cleveland 13, O., at the following prices:

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51 to 100	1.80 ea.
101 to 200	1.70 ea.
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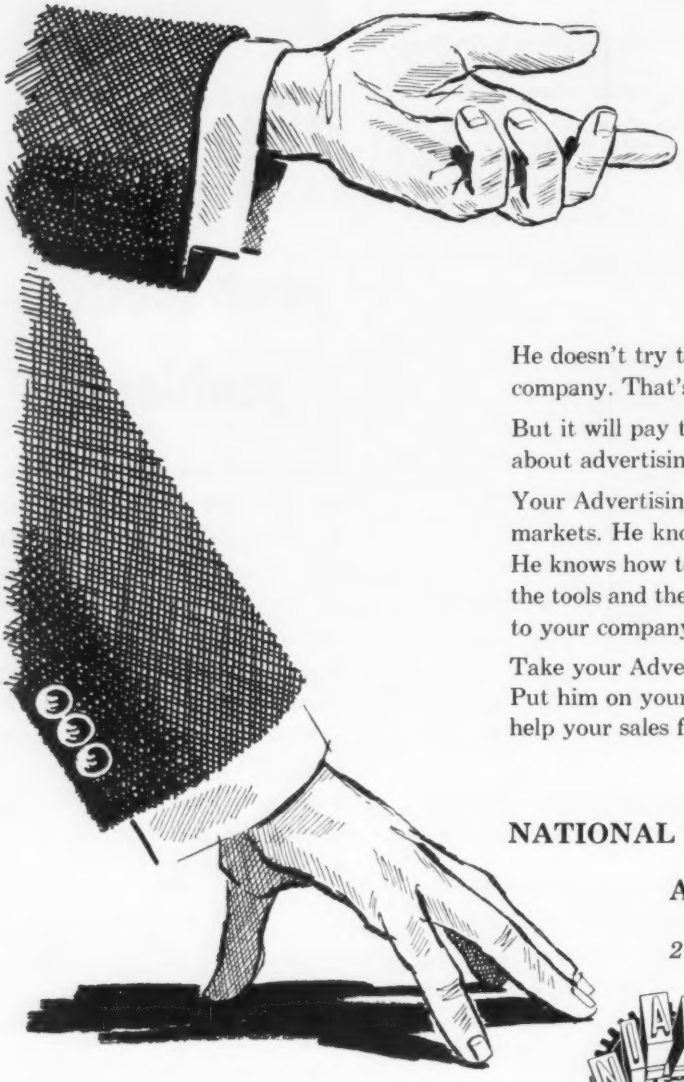
Does your Board of Directors listen to this man?



He doesn't try to tell your Directors how to run the company. That's their job, and he respects it.

But it will pay them to listen to him when he talks about advertising for your company. That's his job!

Your Advertising Manager is a man who knows markets. He knows the science of "mechanized selling." He knows how to help turn sales goals into sales. He has the tools and the know-how to make major contributions to your company's progress and profit.

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NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION, INC.

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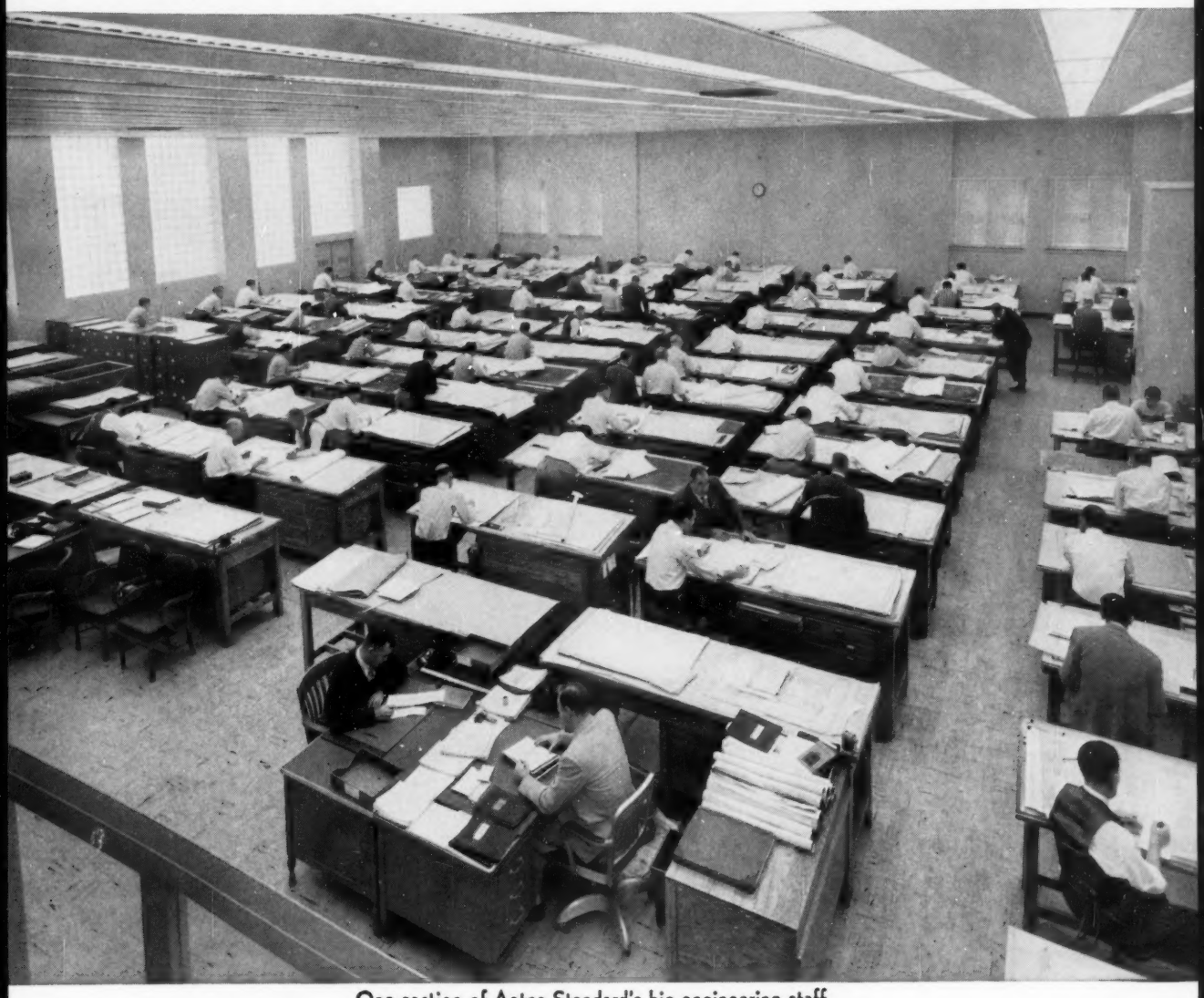
54 YEARS OF DESIGNING AND BUILDING EQUIPMENT



One section of Aetna-Standard's big engineering staff

men at work for ONE PURPOSE

To develop better equipment and more efficient equipment for production of steel, copper, brass, aluminum, in the form of higher quality pipe and tubing, tin plate, galvanized sheet and strip, cold drawn bars and tubes and many other products.

These engineering **idea men** have one purpose — to transform ideas into equipment as exemplified by the Rotary Hot Saw, the Tube Expander, the 5-Draw Drawbench and many ideas of Continuous Galvanizing, Continuous Electrolytic Tinning and Finishing Equipment.

They do not work alone. Many of the ideas for new equipment originate with you, the customer. The Aetna engineering idea staff refines and develops the idea into equipment. This ability to work with customers is one of Aetna's best assets. . . . That's why Aetna-Standard always has been known as **the idea people.**

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THE AETNA-STANDARD ENGINEERING COMPANY

GENERAL OFFICES: PITTSBURGH, PA. PLANTS: ELLWOOD CITY, PA., WARREN, OHIO

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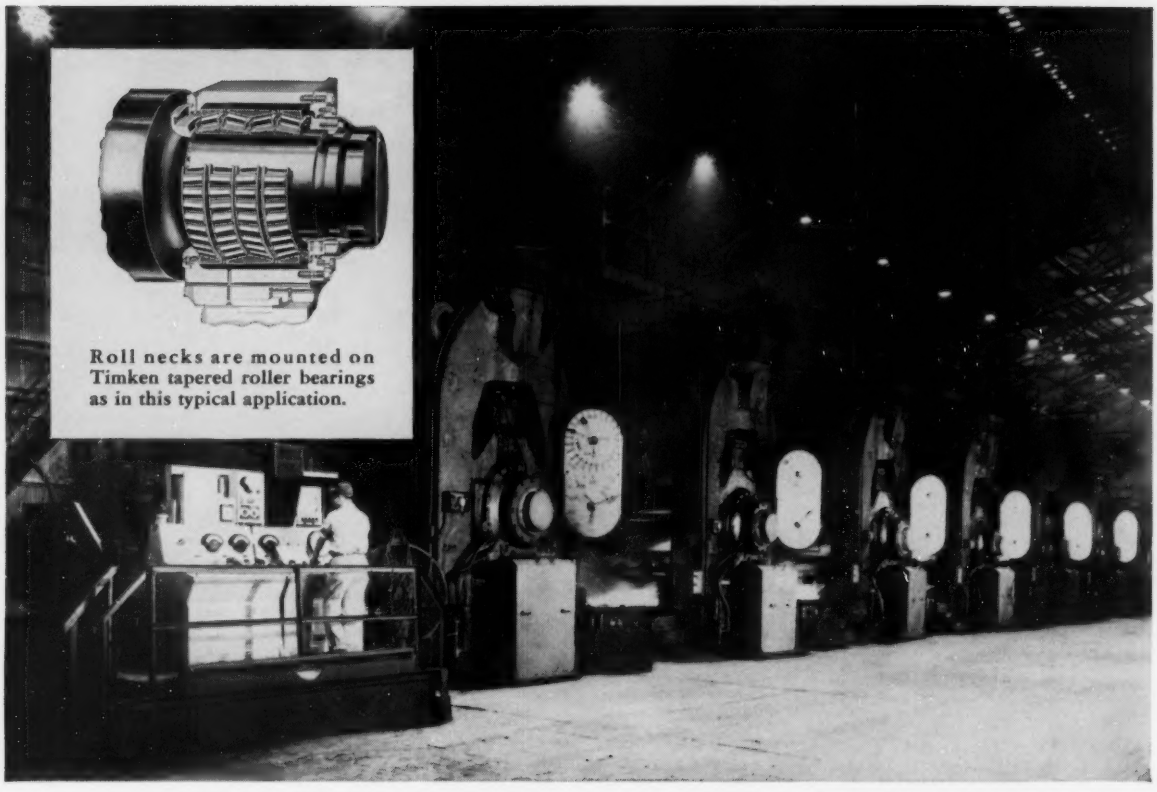

Roll necks are mounted on Timken tapered roller bearings as in this typical application.

New design TIMKEN® work roll bearings average 75% more tonnage than previous design on hot strip mill

TO take the loads of high speed production and reduce mill delays, a Midwestern steel mill installed a new design of Timken® bearings on the work rolls of its 4-high 80″ continuous hot strip mill. By the end of 1955, production figures revealed that the new design Timken bearings averaged 75% more tonnage in the fixed position—where service is most severe. This increased tonnage came from increased radial and thrust capacity in these new bearings. The net result was a substantial reduction in bearing cost. And this new design made higher performance possible with no increase in space. It's another example of how Timken Company engineering can help cut costs and reduce mill delays.

These new design Timken work roll bearings are compiling amazing records because 1) Timken advanced engineering designed these bearings for the job. 2) They were precision-manufactured for longer life. 3) Their true rolling motion, made possible by the tapered design and smooth surface finish, practically eliminates friction. Performance records compiled by mill operators everywhere prove Timken work roll bearings provide minimum cost per ton of steel rolled.

So, to minimize mill downtime with correspondingly lower operating costs, be sure you specify Timken tapered roller bearings in the mill equipment you build or operate. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN *TAPERED ROLLER BEARINGS ROLL THE LOAD*

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